INTERCOLONIAL EXHI

1866-67.

OFFICIAL RE

Intercolonial Exhibition of Australasia,

MELBOURNE, 1866-67.

OFFICIAL RECORD,

CONTAINING

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REPORTS AND AWARDS OF THE JURORS,

AND

ESSAYS AND STATISTICS

ON THE

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INTERCOLONIAL EXHIBITION OF AUSTRALASIA, 1866-67.

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INTRODUCTION.

By J. G. KNIGHT,

Secretary and General Manager, Intercolonial Exhibition 1866-67;
Fellow of the Royal Institute of British Architects, Associate of the Institution of Civil Engineers,
Member of the Society of Arts, Corresponding Member of the Royal Dublin Society,
and of the Royal Horticultural Society of Great Britain.

It is at all times more or less difficult to determine the first true discoverer or propounder of any new idea in science or art, industrial or social progress. It frequently happens that a remark thoughtlessly made by some casual observer to one of a philosophical turn of mind, may start the latter upon a train of study and investigation leading to most important results. To the first is due the credit of having given a useful hint; to the second belongs the merit of maturing and developing the idea, and imparting to it a tangible and practicable form. Whoever may claim to have first thought or written anything about holding an Intercolonial Exhibition of Australasia, of this there can be no doubt, that the realisation of the suggestion is due to the Hon. Mr. Bindon. Without his persistent exertions, warmly aided by the present Government, and most liberally supported by Parliament, the idea of the first Industrial Festival of the Australasian Colonies at Melbourne would not have been realised.

The initiatory steps taken in Parliament on the 12th of May, 1865, are thus recorded in the *Victorian Hansard:*—

INTERCOLONIAL EXHIBITIONS OF INDUSTRY AND ART.

Mr. BINDON moved—"That this House will, on Tuesday next, resolve itself into a committee of the whole, to consider a resolution in favour of inaugurating a series of Intercolonial Exhibitions of Industry and Art, proposed to be held successively in the different Australasian Colonies." He remarked that he would not occupy the attention of the House for more than a few minutes in proposing the resolution. It was scarcely requisite that he should do more than remind hon. members of the value

of the Great Exhibition held in England in 1851. At the present time the influence of that Exhibition was felt in almost every branch of manufacturing industry, and he believed that very important results would attend the establishment of Intercolonial Exhibitions in the Australian colonies. It was extremely desirable that the interchange of thought and communication between the different colonies should be encouraged, that a better knowledge should be diffused of the products of each colony, and that a bond of brotherhood should be promoted amongst them. There were already intercolonial races, intercolonial cricket matches, and intercolonial rifle matches; and he did not see why the colonies should not unite together for a higher and nobler purpose—namely, the promotion of Intercolonial Exhibitions of Industry and Art.

Mr. G. V. Smith, in seconding the motion, remarked that the Great Exhibition of 1851 was said to have buried the memory of Waterloo; and the inauguration of Intercolonial Exhibitions would probably bury any little asperities which existed between the different Australian colonies. It might also prepare the way for a federation of the colonies, which must take place some time at all events. The Exhibitions would promote a friendly feeling between the colonies, and he believed that they would eventually prove a financial success.

Mr. M'Culloch fully approved of the proposition, and believed that, if carried out, it would be of considerable benefit, by promoting a kindly feeling and an interchange of communication and exchange of commodities between the different Australian colonies. By these means, the colonies would arrive at a better understanding amongst themselves, and would be able to unite upon many subjects upon which they were now divided. From what he had seen and heard during his visit to the neighbouring colony, he was quite certain that the public men in New South Wales would heartily fall in with such a proposition. In discussing the Border Customs Duties question with the New South Wales Government, he had frequent opportunities of ascertaining their desire to co-operate with this colony in any matter affecting the interests of the colonies generally. The success of the Exhibitions in London in 1851 and 1862, and the success of the Paris Exhibition, showed the great necessity of the Australian colonies uniting together to derive similar benefits to those which England and France obtained by their International Exhibitions. Such exhibitions would tend to promote a friendly rivalry amongst the colonies, which could not fail to promote the general interests of all.

The motion was unanimously adopted.

Having thus secured the cordial approval of Parliament, the next proceeding was to communicate with the Governments of New South Wales, Queensland, South Australia, Tasmania, and New Zealand, for the purpose of ascertaining how far the project met their approval, and was likely to receive support. The correspondence on this head necessarily spread over some considerable time, and it was not until the 27th of October, 1865, that the Commission for carrying out the Intercolonial Exhibition of 1866-7 was published in the *Government Gazette*.

On the receipt of the requisite instructions and authority, the Commissioners lost no time in dealing in a practical spirit with the important

trust committed to their charge. Offices were taken in the most central part of the city, for the diffusion of information relative to the proposed enterprise. An address, setting forth the advantages and prospects of such an Exhibition, was published and circulated broadcast in the neighbouring colonies, as well as in Victoria. The aid of the Borough and Shire Councils was invoked at an early period of the proceedings, and was in nearly every instance responded to in a most generous and sympathising manner; local Exhibitions, as preliminary to the principal one in Melbourne, were inaugurated at Ballarat, Sandhurst, Castlemaine, Beechworth, Wangaratta, &c.; thus putting all the means available for the purpose of achieving success in motion with the least possible delay.

The foundation being now laid for securing an adequate representation of the products and manufactures of Victoria, the next business of the Commissioners was to take care that the official assurances of support received from most of the adjoining colonies were carried into practical effect. From the earnest and hearty tone of the correspondence with the authorities in Tasmania, Queensland, and Western Australia, the Commissioners, from the first, felt quite assured that those colonies would need no stimulating to take a prominent part in the Industrial Festival. But with regard to New South Wales and South Australia, it was deemed desirable that more formal steps should be taken to secure the hearty co-operation of those colonies. Accordingly, the Rev. J. J. Bleasdale, D.D., and Mr. Knight, the Secretary of the Commissioners, were deputed to visit Adelaide and Sydney for the purpose of affording a more detailed account of the objects of the Exhibition than had been previously conveyed by the official correspondence. Their reception was most kind and generous; but in consequence of the Governments in both colonies having previously nominated Commissioners to make collections for the Paris Universal Exhibition of 1867, some difficulty was felt about a second grant from their respective Parliaments for the expenses of forwarding objects to Melbourne. Happily for the success of the undertaking the objections were not, however, insurmountable. The Government of South Australia promptly undertook to defray their share of the cost, and in New South Wales, after some time spent in negotiation, the Commission acting for Paris was authorised to collect also for the Exhibition here. The concurrence and approval of all the Australian colonies being thus obtained, as also that of the more distant settlements of New Caledonia, the Mauritius, and Netherlands-India, every exertion

was made to render the enterprise a perfect success; and if the universal approval of the Press, and the flattering testimony of the leading visitors from the other colonies can be taken as indicative of public approval, the Colonists have every reason to be satisfied with the results of the undertaking.

The responses to the invitations of the Commissioners being thus favourably acknowledged, the important question of providing adequate accommodation for the guests was the next matter to engage their earnest attention. Experience at once suggested that an Industrial Exhibition, to be effective, must be held in an appropriate and, almost of necessity, in a new structure, size being an important element of success. It was therefore obvious that the old Exhibition-building of 1854 was entirely unsuitable for the intended gathering, and, after various plans and sites had been carefully considered, it was finally resolved to recommend the Government to erect a new building, on such a scale that it would be hereafter available as a Museum.

In accordance with this conclusion, an application was made to the Government to place such a sum on the estimates as would be sufficient to cover the cost of erecting a suite of buildings that would be of permanent utility and of sufficient capacity to receive the expected contributions to the Exhibition. This proposal was most cordially received by the Chief Secretary, the Hon. James M'Culloch, and the Treasurer, the Hon. G. F. Verdon, C.B., and although the sum originally asked for (£16,000) has been exceeded by about £7000 or £8000, both the Government and Parliament showed no reluctance in conceding the additional amount. The outlay did not, however, end here. Applications for space from unexpected quarters continued to pour in upon the Commissioners up to, and even after, the opening of the Exhibition; so that at the last moment it was found that either a large quantity of important specimens of colonial industry would have to be summarily rejected, or that a very considerable extent of extra accommodation of a temporary kind would have to be provided. The latter alternative was wisely determined on, and the capacious iron annexes were erected and paid for out of the receipts of the Exhibition, at an expense of about £1000.

The sum granted for carrying out the contract was also found insufficient to cover the cost of completing the decorations of the buildings, laying on gas and water, flooring certain portions, providing entrance porches, retiring rooms, and other necessary appendages; and all these works had to be paid for out of the receipts derived from the Exhibition, their cost being upwards of £3880.

In addition to these matters, £1743 was expended out of the Commissioners' funds on fittings, cases, drapery, and other material and labour connected with the receiving and setting up of the various exhibits, as also on some of the exhibits themselves; the whole of which stock has now been handed over to the Government, forming a considerable item of assets.

It would be a great mistake to suppose that because the Exhibition became eventually an important success, that its attractions were self-acting. The contrast between an old and a new country is very striking in such matters. In Europe it is only necessary to announce the intention of holding an Exhibition, when immediately the leading manufacturers become clamorous for space, usually applying for ten or twenty times more than the area contained in the proposed edifice; while in new countries or colonies it follows almost as a matter of course that (competition being more restricted, and the opportunities of production more difficult) manufacturers and producers require stimulating to exhibit at all. Such was the case at our late Exhibition, and it was only when the success of the enterprise was well assured that a great number of persons came forward to "hold their own" and vindicate their callings.

Such reasons will account for the additional labours incurred by the Commissioners and their staff. From the date of their appointment to the opening of the Exhibition regular meetings of the Commission were held, in addition to sub-committees, and at these an average majority of the members attended. From the opening to the close of the Exhibition there were sixty ordinary meetings of the Commission, besides regular weekly meetings of the Organisation and Finance Committees. To the exertions of the latter body (Messrs. Bindon, Bright, and Harker) must be ascribed the economical dispensation of the funds of the Commission, the strictest supervision of every shilling of the receipts and expenditure being enforced by the Committee of Finance.

Some idea of the extent of the correspondence carried on from the office of the Commission, may be gathered from the fact that 11,610 letters and 400 packets of information relative to the Exhibition were sent through the post-office, in addition to a vast amount of written and printed matter distributed by hand in Melbourne and its vicinity.

The general scheme of the enterprise being organised, applications for space from intending exhibitors began to follow, and it soon became evident that a great collection of objects would eventually be accumulated; but as the time approached for the opening of the Exhibition

it was discovered that many of the earliest applicants were not in earnest, or at any rate were not forthcoming when called upon; while a larger number, who had given no official intimation of an intention to exhibit at all, were sending their goods to the Exhibition, taking it for granted that they would be duly received and cared for. Such changes necessarily embarrassed the administration of the Commissioners, but it was deemed to be of less consequence that their regulations should be infringed upon rather than any meritorious objects should be excluded from the Exhibition, although sent in after the prescribed time. Taking into consideration the difficulties and unforeseen expenses inevitably associated with the introduction of manufactures or products in new countries, the Commissioners acted for the best in allowing exhibits of interest to be brought in even after the opening of the Exhibition; but it cannot be denied that the concession was attended with some disadvantages, one being that the Commissioners were compelled at the eleventh hour—a few weeks only before the opening of the Exhibition—to provide a large extent of additional building accommodation; and another, that, with goods pouring in without previous notice, at so late a period, it was absolutely impossible to make up anything approaching a correct first edition of the *Official Catalogue*. However, notwithstanding these incidental troubles, everything was marshalled into fair and presentable order by the day of opening, the 23rd of October, 1866, and with a view to preserve a public record of an event of some significance in the history of Australia, the following account is in part taken from the *Argus* of the ensuing day:—

The Third Melbourne Exhibition of natural products and works of art was formally opened by His Excellency the Governor, at noon yesterday, in the presence of a large concourse of ladies and gentlemen. The first of these now familiar gatherings took place in 1854, anticipatory of the Paris Exhibition held in the following year. It was a creditable display for the period; and the fact of a light and presentable structure of wood and glass having been erected for the purpose, added to the enthusiasm which the occasion evoked. The collection of articles constituted, however, rather a bazaar than an exhibition, in the modern sense of the term, most of them having been supplied by fancy-goods men and general importers. Native produce was but poorly represented, and out of the entire list of exhibitors only thirty-six were in a position to contribute to the Australian Court at the Paris Internationial Gathering. The Exhibition held in 1861 was a great improvement on its predecessor, the articles

exhibited of local growth and manufacture being numerous and interesting. The building constructed in 1854, with the addition of an annexe nearly as large as itself, was used for housing this collection. The affair was an undoubted success here, and resulted in the Victorian Court achieving a position of proud pre-eminence at the London gathering of 1862. It was declared by the compiler of the *Illustrated Catalogue* for that exposition that "a more extensive and varied collection had never before been sent from any British colony to Europe." These two events, however, though notable in Melbourne annals, sink into insignificance when compared with the magnificent undertaking which was yesterday inaugurated. Both in conception and execution our third exhibition stands out as a grand and peculiar one. For the first time, the various colonies of Australasia meet in friendly competition at an independent gathering. It has been many months in preparation, and the interest attaching to it has gradually increased, as exhibition after exhibition, in preparation for the central one, has been held in the large provincial towns of Victoria and the capitals of the neighbouring colonies. The response to the invitation issued by the Victorian Commission, though for a time in some quarters doubtful, has been a satisfactory one, and Melbourne may well feel gratified at the triumphant result.

Whoever may have originated the idea of holding an Intercolonial Exhibition, to Government and Parliament belongs the credit of having promptly adopted it, and taken steps to insure its realisation. The Commission nominated for the purpose was appointed a year ago—viz., on the 27th October, 1865—and consisted, in the first instance, of the following gentlemen:—Sir Redmond Barry, Hon. George Harker, Hon. G. F. Verdon, Hon. J. F. Sullivan, Sir James Palmer, Hon. C. J. Jenner, M.L.C.; Hon. Wm. Degraves, M.L.C.; Sir Francis Murphy; Messrs. S. H. Bindon, M.L.A.; J. C. Riddell, M.L.A.; J. T. Smith, M.L.A.; Edward Cope, M.L.A.; Rev. J. J. Bleasdale, D.D.; Thomas Black, Ferdinand Mueller, F.R.S.; Professor M'Coy, Phipps Turnbull, Charles E. Bright, T. J. Sumner, and Robert M'Dougall. Mr. J. G. Knight, who from his previous experience in connection with the Victorian Exhibition of 1861, the London Exhibition of 1862, and the Dublin Exhibition of 1865, was generally regarded as the fittest for the work, was made Secretary to the Commission, to which the following names were subsequently at various times added:—Count de Castelnau, Hon. J. Macgregor, Hon. W. M. K. Vale, Messrs. Wm. Bayles, M.L.A., James Harrison, and William Williams, Mayor of Melbourne. It was speedily perceived that the structure which had served for the previous

exhibitions would be utterly inadequate to accommodate the collection which the various colonies might be expected to bring together; and one of the first important acts of the Commission was to decide on uniting with the Trustees of the Public Library in erecting an edifice worthy of the occasion, and suitable for the requirements of a Museum after the temporary purpose had been served. As a consequence of this resolution, we have the building which has now been opened to the public. Excepting in so far as the plan of this structure is concerned, Mr. Reed, the architect, has enjoyed but little opportunity of displaying his taste. Only the foundations and lower walls of the Great Hall and Octagon are permanent; the superstructur eis of wood, which, though capable of sustaining its position for many years, admits of no elaborate architectural embellishment. The beauty of the interior is solely owing to its large size and to the elegant decorative colouring which has been laid upon it. The name of the gentleman—Mr. E. L. Bateman—who has accomplished this portion of the work, deserves to be remembered wherever any interest in the success of this Exhibition is felt. Even filled with all the rich exhibits which the colonies could contribute, the large room and octagonal hall owe one-half their charm to the delicate and harmoniously-blended tints upon which the eye rests when lifted to the upper part of the walls and to the roof.

The buildings occupied by the Exhibition consist of the Great Hall, a spacious Octagon leading to it from the Public Library, two open-air Courts on each side of this Octagon, a Northern Wing containing the machines, a Southern Wing devoted to the pictures, and a large Iron Annexe, entered from the Central Hall by a short covered way, and leading direct into Russell-street. In addition to these, there are the unoccupied portion of the garden in the rear of the building, which will speedily wear a more ornamental aspect than it now presents, and the basement underneath the Picture Gallery set apart chiefly as dining-hall and refreshment-rooms, but also with cellars devoted to the exhibition of preserved meats, wines, beers, &c., of which there is a fine collection. When it is remembered that the Central Hall is 220 feet long and 82 feet in breadth, and that the rest of the structure is built on no limited scale, the amount of space at the disposal of the Commission is seen to be considerable. Large as it is, however, it has been found insufficient, and in many instances the goods have had to be crowded together in a way that scarcely does justice to their handsome appearance. But this has been unavoidable. As is too frequently the case in

enterprises of this kind, the exhibits have been crowded in at the last moment, rendering the process of arrangement extremely difficult. At the date originally fixed by the Commission as the limit for the receipt of applications for space, very few had come in; it therefore became necessary to extend it from time to time, until at length applicants became almost more numerous than welcome, and the decided success of the undertaking was assured. This lateness of entry, however, has led to some confusion, both as regards position in the rooms and accuracy in the catalogues. These latter have been very neatly printed by Messrs. Blundell and Ford; but inasmuch as the circumstance to which we have referred has caused entries to be made of goods which are not represented, and goods to be present which are not catalogued, a corrected edition will have to be speedily issued.

Before proceeding to give a detailed account of the opening, and such description of the exhibits as a first inspection renders possible, we would briefly refer to the brilliant scene which set off yesterday's ceremonial. To those who had seen the Hall on the previous evening, the aspect it presented produced a surprise which can only be fittingly characterised by the use of Dominie Sampson's favourite word "prodigious." Notwithstanding that the men under Mr. Knight's charge had been working for the preceding two weeks with a vigour untiring, Tuesday witnessed a spectacle of confusion which seemed hopeless. One night, without the aid of fairies, had accomplished wonders. A golden pyramid reared its crest to the roof, where before had been vacancy; ugly half-finished trophies had grown into things of beauty; banners, before huddled together out of sight, hung in proper order; eyesores of partitions had disappeared, discovering long unincumbered vistas; empty cases had become full ones—in short, a vast lumber-room had been turned into a splendidly-appointed bazaar. By half-past ten all this was completed. At eleven, the season ticket-holders began to stream into the building; and at twelve, when His Excellency the Governor, accompanied by Lady and Miss Manners-Sutton, with the members of His Excellency's family, entered, and the excellent orchestra in the gallery struck up the National Anthem, the room was crowded. It is not too much to say that a finer sight has never been witnessed in Australia. The centre of the building, occupied by the decorated daïs and its approaches, and filled with the well-dressed throng to whom the privilege of *entrée* had been accorded; the rest of the floor of the room yet more densely packed; the prettily arranged courts, each with its distinctive banner; the elegant trophies and crystal ornaments; and the fine expanse of lofty roof, made

up a scene which we venture to assert few colonies have ever beheld, and the effect of which to those present was heightened by the grand music of the "Hallelujah Chorus" pealing through the Hall.

THE INAUGURAL CEREMONY.

The ceremony of inauguration was carried through felicitously from first to last. The lowering sky reduced the crowd of on-lookers at the chief entrance to the lowest point public curiosity would permit, but then the several hundreds who were there were enough to give the street the cheerful air so much required on occasions of the sort. A sufficient body of police were by, to secure order, and they did their work efficiently. By eleven o'clock there was a press at the doors to obtain admission, but it was never very violent, thanks to the excellent arrangements. Drawn up at the entrance by which the Governor was to enter was a guard of honour, composed of about 120 volunteers, belonging to the East Melbourne, Emerald Hill, St. Kilda, and Metropolitan Artillery Corps, and the Melbourne and North Melbourne, Carlton, Collingwood, East Collingwood, Richmond, and Southern Rifles, under the command of Lieutenant-Colonel Mair. Inside the building the spectacle was splendid. The Hall was divided by portable barriers into three compartments. The centre was for the inaugural ceremony, and only those who had special cards of *entrée* were admitted to it. Other ticket-holders had ingress to the spaces on either side, which were quite filled, and about 1500 persons were witnesses of the proceedings. In this central area had arisen during the night the pyramid of gold, the original design of Mr. J. G. Knight, representing the amount of the precious metal which had been obtained in Victoria, and its dimensions since 1861 had greatly increased. Opposite, on the western side, was the daïs, on which were seats for His Excellency and family, and it was surmounted by the elegantly-painted banner of the Brunswick Municipality, on which the Royal Arms is pourtrayed. Round about floated other similar banners, whose general beauty threw into most disagreeable contrast one of those coarse imitations of the Royal Standard which are generally to be found on Government buildings on state occasions. Towards noon, the appointed hour, the groups grew larger and closer, and among those present were the following Commissioners, whose late President, Sir Redmond Barry, was absent:—Sir Francis Murphy, the Hon. Minister of Justice, the Hon. George Harker, the Hon. C. J. Jenner, M.L.C., the Hon. W. Degraves, M.L.C., Rev. Dr. Bleasdale, Dr. T. Black, Dr. Mueller, Professor M'Coy, the

Count de Castelnau (consul for France), the Hon. Minister of Mines, the Hon. Commissioner of Public Works, Mr. W. Bayles, M.L.A. (Mayor of Melbourne), Mr. C. E. Bright, Mr. W. Williams (Mayor of Melbourne elect), Mr. R. M'Dougall, Mr. J. T. Smith, M.L.A., Mr. P. Turnbull, Mr. J. C. Riddell, M.L.A., Mr. James Harrison, and Mr. E. Cope, M.L.A. Besides, there were Brigadier-General Carey, commander of the forces, and his staff officers, Colonel Tupper and Major Buchanan; the Hon. Chief Secretary, the Hon. Minister of Lands, the Hon. Commissioner of Customs, also commissioner for Southland; His Honour Mr. Justice Williams; the Bishop of Melbourne, who represented the Church of England; the Rev. W. R. Fletcher, M.A., who represented the Independent Church; and the Rev. J. Ornstien and the Rev. M. Rintel, who represented the Hebrew body (neither the Presbyterian nor any other religious body sent representatives); his Honour Judge Pohlman; Dr. Brownless, vice-chancellor of the Melbourne University; Mr. J. W. Ploos Van Amstel, consul-general for the Netherlands; Chevalier Giuseppe Biagi, consul for Italy; M. Adalbert Kruge, consul for Prussia; Mr. Cooper, consul for Portugal; Mr. J. B. Were, consul for Denmark, Chili, Brazil, Sweden, and Lubeck; Mr. Sali Cleve, acting-consul for Hamburg, Bremen, and Hanover; Mr. H. Follet, vice-consul for France; Mr. J. Damyon, vice-consul for Russia; Mr. G. Russell and Mr. J. Wilkie, representatives of New South Wales, and Mr. Dyer, secretary to the Commission; Mr. B. Herschel Babbage, representative of the South Australian Commission; Mr. R. Walker, Mayor of Hobart Town, Mr. Lewis, M.H.A., and Mr. B. B. Nicholson, representatives of the Tasmanian Commission; Mr. Mathieu, Colonial Secretary of New Caledonia, and M. Boutan, representatives of that colony; Mr. R. H. Bland, who, with Mr. J. B. Were, was representative of West Australia; Mr. G. Duncan, Mayor of Ballarat West, who, together with the Rev. J. J. Halley, Mr. Cutter, Mr. T. B. Mathews, Mr. St. John, Mr. Lever, Mr. Lorimer, Mr. James, and Mr. Charles D. Cuthbert (hon. secretary), represented the Ballarat Commissioners; Mr. M'Intyre, Mayor of Sandhurst, who, with Mr. Holmes, Mr. Burrows, and Mr. Gray (hon. secretary), represented the Bendigo Commissioners; Colonel Anderson, Commandant of Volunteers; Captain Norman, of H.M.C.S.S. Victoria; Lieutenant-Colonel Mair, R.A.; and a large number of members of both branches of the Legislature. There was also present a large and brilliant assemblage of ladies.

A few minutes before twelve, so complete were the preparations, Mr. J. G. Knight, the secretary to the Commissioners, appeared with bound copies of the *Exhibition Catalogue*, wet from the printers and binders, for the more distinguished of those present.

As noon struck the vice-regal party arrived. His Excellency, Lady Manners-Sutton, and family appeared at the entrance communicating with the Public Library, and proceeded to the daïs. On the moment the band and chorus of three hundred performers, with Mr. C. E. Horsley conducting, commenced the National Anthem with thrilling effect. It was arranged in harmony and unison, and embellished with original instrumental accompaniments by the conductor, and it pealed grandly through the vast hall. As it concluded, Sir Francis Murphy, the Acting-President of the Commissioners, who surrounded the daïs, stepped forward and read the following address :—

"To His Excellency the Honourable Sir John Henry Thomas Manners Sutton, Knight Commander of the Most Honourable Order of the Bath, Governor and Commander-in-Chief in and over the Colony of Victoria, &c.

"We, the loyal and faithful subjects of Her Most Gracious Majesty, being the Commissioners appointed by Her Majesty for managing and conducting all matters relating to and concerning the Intercolonial Exhibition of Industries and Art, now about to be opened, desire to welcome your Excellency on this auspicious occasion, with all dutiful respect, and to convey to you, as the Representative of Her Most Gracious Majesty, the renewed expressions of our loyalty.

"We beg to state to your Excellency that, by the munificence of Parliament, we are now assembled within a hall unequalled in the southern hemisphere, and which, for extent and accommodation, as well as excellency of workmanship, will, when finished, be a lasting monument of the public spirit of our Parliament and the enterprise of our people.

"A report in detail of our proceedings will be laid before you, together with essays illustrative of our great natural resources, and of the social condition of the country, freely contributed by some of the most eminent men in our community.

"It is also our duty to inform your Excellency of the cordial manner in which this Exhibition has been supported by all classes in this country, and of the intelligent help which we have received from the manufacturers and workmen of every kind, to whose practical and generous efforts we are indebted for much of our success. We desire also to acknowledge the services of our late president, Sir Redmond Barry, in promoting the objects of this Exhibition.

"We congratulate your Excellency on the arrival among us of representatives from New Caledonia, being part of the dominions of His Imperial Majesty the Emperor of the French; and also of the important city of Batavia, part of the dominions of His Majesty the King of the Netherlands—bringing to us the products and manufactures of their respective countries, and pledging themselves to a friendship and brotherhood in the objects of this undertaking.

"We further show to your Excellency that by the public spirit, intelligence, and industry of our sister colonies, we have gathered within these walls a collection of natural products proving the richness of their industrial resources, and a collection of works of art, manufactures, and

machinery, exhibiting the genius of their artists, and the enterprise and the skill of their workmen, contrasting in friendly competition with our own—all being suggestive of a future time when the Australian colonies will be great and prosperous States, rivalling European kingdoms in all that is worthy of rivalry, and bound together by a united and loyal affection towards the British crown, as well as by the blessings of industry and peace.

"We earnestly hope that this Exhibition may be as productive of increased intercourse, of friendly relations, and of all the industrial advantages among these southern colonies, as exhibitions of a similar kind have been among European nations; being an additional proof, even in these southern seas, of the forethought and sagacity of the good and illustrious Prince Albert, whose memory will be ever revered and associated with exhibitions of industry and art.

"We now ask your Excellency to delare this Exhibition open; and we fervently pray that, under the blessing of Divine Providence, it may help our industries, promote our prosperity, and be a bond of strength and union among the Australian colonies and the friendly peoples associated with us on the present occasion."

He also handed to His Excellency the following

"REPORT OF THE ORGANIZATION COMMITTEE.

"On the 27th October, 1865, a Royal Commission was issued by His Excellency Sir Charles Darling, appointing certain gentlemen to act as commissioners for carrying out the arrangements for an Intercolonial Exhibition. They have now the honour to furnish your Excellency with the following report of their proceedings:—

"The first matter that claimed their attention was to find suitable accommodation for the proposed undertaking; and it was decided at one of the earliest meetings of the Commissioners that it would be inadvisable to expend funds upon additions to the old Exhibition-building in William-street, but that proposals should be made to the trustees of the Public Library for collectively employing those placed by Parliament at the disposal of each for the erection of buildings which, after the close of the Exhibition, would form an addition to and be made available for purposes in connection with the Public Library.

"The architect, Mr. Joseph Reed, formed the design, which resulted in the construction of this magnificent Hall; and the Commissioners were fortunate in obtaining the services of Mr. E. L. Bateman to superintend the work of decoration, which he has performed so ably.

"The buildings were commenced as soon as possible, and speedily finished.

"The Great Hall, in which there is so large an assemblage, is 220 feet in length and 82 feet in breadth, containing 17,200 superficial feet; the Rotunda, 3000; the North and South Wings, 4250 superficial feet each.

"Owing to the numerous applications for space by intending exhibitors, the buildings were found inadequate to meet the demand, and it was therefore deemed advisable by the Commissioners to erect the Eastern Annexe, containing 7800 superficial feet; and even subsequently to increase its size by 3000 superficial feet, extending the roof to the entrance-gate at Russell-street. These buildings, together with the open courts, giving a total of 56,240 superficial feet of available area.

"It was thought desirable to divide the objects for exhibition into six great classes:—Mineral products, animal products, agricultural with horticultural and indigenous vegetable products, manufactures and the useful arts, the ornamental arts, and machinery.

"A committee of gentlemen was appointed to take special charge of each class, and cordial thanks are due to those gentlemen who have devoted much of their valuable time and attention in the successful carrying out of the project.

"Sub-committees were then formed for arranging the details, and the duties which have hitherto devolved upon them have been cheerfully undertaken, and we have no doubt they will still use their utmost exertions for the eventual success of the undertaking.

"The Great Hall and adjoining Rotunda are devoted to the purpose of displaying many and various articles of the greatest interest. To enumerate them all here is impossible, but special notice should be taken of the collection of minerals, comprising a great variety of the most valuable description.

"The specimens of precious stones will be doubtless viewed with much interest, collected through the energy of the Rev. Dr. Bleasdale. Gold and silver, in their natural state and refined, will be found in a case constructed of various colonial woods. The banks of Melbourne have kindly placed at the disposal of the Commissioners valuable specimens, whilst from the various mining districts beautiful collections of quartz intermixed with gold have been forwarded.

"A pyramid is shown, constructed by the energetic Secretary of the Commission, Mr. Knight, illustrative of the quantity of gold the production of Victoria from the year 1851 till a recent date. This structure is intended for transmission to Paris, to be placed in the Exhibition-building there.

"That the great reputation Victoria has earned in the production of wool is well deserved, is evinced by the samples now in this building.

"The local exhibitions held since last harvest, assisted by the Agricultural Societies of Victoria, have afforded the Commissioners an opportunity of obtaining the best and most varied samples of grain. From their excellent quality they will compare favourably with the production of any other country.

"Wines made in Victoria are much used throughout the colony, being peculiarly suited for these climates. The character of Australian wine is well represented in this Exhibition.

"The specimens of indigenous woods, and their products, collected by Dr. Mueller, deserve particular attention. Time alone is required to ascertain the commercial value of the products of our forests, and if adapted for ornamental or other purposes.

"Models of fruits and vegetables, from their size and beauty of colour, the exact representation of nature, point to the excellence of our climate and soil.

"The organisation of various local exhibitions throughout the colony has been of much service and assistance, for to the unwearied exertions of the local committees the Commissioners are greatly indebted.

"Products from the exhibitions held at Ballarat, Sandhurst, Castlemaine, Beechworth, &c., have separate courts allotted to them in this Hall; and complete collections have been presented from the districts of Wangaratta, Dunolly, Clunes, St. Arnaud, and others. Our sister colonies—

New South Wales, Queensland, South Australia, Western Australia, Tasmania, and New Zealand—are worthily represented by most complete collections of their various products and manufactures, an evidence of the richness of their resources and enterprise of their population. Special commissioners, as representatives, have been sent to attend this Exhibition, and have been for some weeks past actively engaged in arranging the various exhibits collected either through the liberality of their respective governments or private means.

"The North Wing has been set apart for the arrangement of various kinds of machinery; and in order that nothing may be wanting to make this important department perfect, three engines, of twenty, sixteen, and four horse power each, are erected in the adjacent court, to afford the necessary motive-power.

"The South Wing is intended for the exhibition of paintings; in it will be found many of excellent execution and of much value, comprising amongst others the valuable collection belonging to the colony, hitherto exhibited in the Public Library.

"In the open Courts will be observed fountains of the most beautiful and novel descriptions, which will add much to the success of the flower shows intended to be held from time to time, and arrangements for which have been made with the Horticultural Society of Victoria.

"Pipes from the Yan Yean Water Reservoir have been laid all over the buildings, so as to allay all apprehension of accident from fire; and an abundant supply of water will be forthcoming for all purposes.

"In the Eastern Annexe will be found carriages of all descriptions manufactured in Victoria, and it is believed they will contrast favourably with those of any other country in the world, both with respect to workmanship and durability. In this portion of the building will be found also many other articles of the most interesting nature; and attention is directed to the collection of war material courteously placed at the disposal of the Commissioners—one interesting exception to the general colonial character of the Exhibition.

"Much information, in the form of Essays, has been provided by gentlemen in public departments, and ordered for publication; and it is intended that these works shall also be published in the French language. Mr. Brough Smyth, of the Mining Department, has kindly furnished a lengthened description of the mineral resources of the colony. Professor M'Coy, professor of natural science in the University of Melbourne, makes a learned report upon recent and fossil zoology. Mr. Selwyn, Government geologist, has presented a full and elaborate treatise upon the physical geography, geology, and mineralogy of Victoria. Dr. Mueller, our scientific botanist, a varied essay upon botany and the general vegetation of the Australian continent, in conjunction with agriculture. Mr. Ellery, the Government astronomer and director of the meteorological department, gives a most interesting description respecting the atmospheric changes of our climate and other observations made at the Melbourne Observatory. Mr. Archer, full and elaborate statistics of the colony; and Dr. Bleasdale, an interesting account of gems and the precious stones of the colony.

"Lists of jurors are now in course of preparation, and ere long the perhaps most difficult and laborious work will be commenced, namely—awarding to those who merit it a distinction earnestly hoped for by all exhibitors.

"A medallion has been designed by Mr. Summers, both chaste and

simple, which it is intended to present to those considered worthy by the jurors of this distinction.

"It has been the object of the Commissioners so to classify and arrange the various exhibits that each article may be distinctly shown.

"The Catalogue has been compiled with the greatest care, and contains the fullest information.

"Rejoiced indeed are all in affording a hearty welcome to the Commissioners who visit us with exhibits from the French colony of New Caledonia—a happy proof that the amicable arrangements existing between the mother countries extend to these remote colonies in the southern hemisphere.

"The Dutch colony of Java honours Victoria in having accepted the invitation, and is present in this Exhibition; and from the varied samples of produce it is to be hoped material commercial advantages will accrue to both.

"The Commissioners have to notice with profound regret the absence of their late president, Sir Redmond Barry, to whose zeal, support, and untiring activity much of the success of this great undertaking is attributable.

"In conclusion, they hope that the Intercolonial Exhibition, in some degree preparatory to the arrangements for forwarding certain productions to Paris for the Exhibition to be held there in 1867, may in its results prove beneficial, not only to Victoria, but the whole of Australasia, and bear a favourable comparison with the Exhibition of 1861, which was held for the purpose of showing in London, in 1862, the various industries and productions of this country, and may become a new starting point, from which more intimate social and commercial relations may arise.

"By order of the Committee,

"CHARLES EDWARD BRIGHT, Chairman."

His EXCELLENCY replied as follows (raising his voice to be heard throughout the greater part of the building):—

"Sir Francis Murphy and Gentlemen of the Commission—

"It is in the first instance my pleasing duty to offer to you my acknowledgments for the expression of your loyalty to our Queen; and, in thanking you for the welcome which you have on this auspicious occasion tendered to me as Her Majesty's representative, I wish to assure you that I am very sensible of the unwearied energy and zeal which you and your late president, Sir Redmond Barry, have displayed in the performance of the duties entrusted to the Commission, and that it is most gratifying to me to take part in a ceremony which announces the successful completion of your preparatory labours.

"This Exhibition, gentlemen, is intended for the instruction as well as the amusement and gratification of those who visit it. It will, I trust, confer material advantages as well as honour on those who have contributed to the treasures which it displays, and it will, I am confident, promote increased intercourse and feelings of friendly sympathy between the communities and individuals who have united in this combined effort to obtain excellence for themselves, and improvement for all, by a frank and free competition here with their neighbours, and subsequently in Paris with the industry and skill of the world.

"Such, gentlemen, are, I conceive, the primary objects of the promoters

and contributors to this Intercolonial Exhibition. I rejoice to learn that New Caledonia and Batavia have associated themselves with us for the attainment of these objects; and I unite with you in offering to their representatives, as well as to those of our sister colonies, a cordial and hearty welcome.

"It is no part of my duty on this occasion to endeavour to designate or select from among the exhibits any particular article, or collection of articles, for special approval or attention. But I should do injustice to you, as well as to my own feelings, if I did not avail myself of this opportunity of expressing to you, and through you to the architects, my high appreciation of the beauty of the design for this magnificent Hall, and of its remarkable excellence in an architectural point of view, as well as for the extent of the accommodation which it provides.

"And I may observe that the fact that this Exhibition Hall and the Public Library form parts of the same building affords, as it appears to me, a peculiarly apt illustration of the closeness of the connection between industrial progress and scientific research.

"If, gentlemen, we turn to the gold-fields of this colony, where the introduction of improved machinery and new chemical appliances have in a very limited period produced such marked results, we shall probably discover there the most conclusive proof afforded in this part of the world of the truth and practical importance of this maxim.

"But it is in reality applicable to all industrial pursuits, here as elsewhere; and I trust that this Exhibition will be, as each of those which have preceded it has been, the prelude, as well as an incentive, to an increased knowledge and appreciation of those laws of science and art by which industry is taught to select the paths leading directly to success, as regards the extent and remunerative character as well as the beauty of its productions.

"We may, gentlemen, well feel gratified at being enabled, by the blessing of Providence, to display on this occasion new proofs of the unsurpassed, if not unequalled, richness of our natural resources, and to point to the past as a period of rapid industrial progress and improvement.

"But it should be remembered that it is only in connection with and as it bears upon the future that the true and full value of the past can be ascertained and tested; and while we are entitled, with feelings of humble gratitude to the source from whom all real success is derived, to regard this Exhibition as a trophy commemorating industrial victories already achieved, and an industrial position already attained, I invite you to regard it also as affording the starting point from which we should direct our exertions for the future. And in this invitation I bring before your notice, almost in his own words, the teaching of that illustrious Prince whose genius, no less benevolent and practical than comprehensive and philosophical, originated and elaborated the idea from which this and all other similar exhibitions have sprung, and to whose pre-eminent services in the cause of scientific and artistic industry you have already, in your address, offered your tribute of well-merited veneration and gratitude.

"Gentlemen—I unite with you in the fervent prayer that, by the blessing of the Almighty, this Exhibition may conduce to the material prosperity of each of the communities whose industries are represented in it, and promote friendly sympathy and mutual co-operation between all. And, in accordance with your request, I now declare it to be open, 24th October, 1866."

The musical part of the ceremony, which was mostly of a religious character, then began. First was sung, by the performers before-mentioned, the Old Hundredth Psalm, also arranged for the occasion by Mr. Horsley, which was given with great steadiness, and listened to with reverence mixed with pleasure. Handel's Hallelujah Chorus followed, and was heard with evident interest and delight, as it set forth in triumphant tones the joyous and thankful feeling that naturally prevailed. The performance concluded with a grand march composed by the conductor for the occasion. In describing it we cannot now go into detail, but believe it will be admitted by the initiated to rank with the best compositions of our time. It was performed by the band with care and zeal, and elicited loud applause at its conclusion. It will not be out of place to state here that Mr. D. Lee ably presided at the new organ, and Mr. E. King took the principal violin with his usual judgment and precision. The organ was built by Mr. Fincham, of Richmond, and when completed will be the largest instrument in the colony. At present, however, only the "swell" organ has been constructed, the great organ and choir organ being wanting. In its existing state it has only one key-board, but it has been built so as to allow the introduction of a second and third, when the other ranks of pipes are added. The swell, as finished, possesses the following stops:—Open diapason, stopt diapason, dulciana, principal, claribella, flute, twelfth, fifteenth, and sesquialtera, the last acting upon three ranks of pipes. There is, in addition, a very powerful pedal diapason (16 feet). The Commissioners, we understand, have only made arrangements to pay for the use of the organ in its present state, and it is probable that the instrument will not be completed until purchased. It may be mentioned that all the materials used in the work, including the "spotted metal" for the smaller pipes, have been manufactured by Mr. Fincham, who has every reason to be proud of the work.

The inauguration was now over. Cheers were heartily given for the Exhibition, the Queen, and the Governor, and in a few minutes the barriers were removed, and the company spread all over the building. Up to the latter part of the afternoon, 1737 persons holding season tickets had passed at the doors.

Having briefly sketched some of the leading features of the Exhibition up to the date of its opening, a few facts and figures may now be given with reference to it in comparison with former efforts in a similar direction.

Since the foundation of Victoria, there has always been a disposition to foster and encourage home productions by means of exhibitions. So far back in our brief history as 1850, the Victorian Industrial Society, under the management of the late Mr. Le Souef, commenced its annual gatherings, and afforded most valuable aid to the cause of a then dawning colonial enterprise.

The first Colonial Exhibition on a large scale was held in Melbourne in 1854, preparatory to the despatch of objects to the Paris Exhibition of 1855; and it says something for the enterprise of Victoria that in those "dear times" £21,000 should have been spent on the erection of the Exhibition Building in William-street, a structure which, though now too old and inadequate for the growing wants of Melbourne, has done the State good service, and has been of inestimable value to the public at large.

At the first Melbourne Exhibition of 1854, in preparation for, and tributary to, the Paris Exhibition of the following year, there were 428 exhibitors, by far the greater portion being of imported goods.

At the Victorian Exhibition of 1861, in anticipation of the great London Exhibition of 1862, there were in all 703 exhibitors catalogued.

This Exhibition was, on the whole, highly successful. The total receipts for admission for the ten weeks during which it was open amounted to £3400. It is proper to mention that the receipts were greatly augmented by having musical performances. The cost of the music must, of course, be considered; but, financially, it was found that music was profitable as well as attractive.

The prominent position assigned to the Australian Colonies at the Great Exhibition of London in 1862 is now a matter of history, and the following extracts will show that none of them have reason to regret the efforts they made to be duly represented, or have need to find fault with the tone of English criticism upon them.

Mr. Hollingshead, in his admirably written "History of Exhibitions," which forms the introduction to the *Illustrated Catalogue of the International Exhibition of* 1862, makes these observations on the colonies:—

In 1851 the colonies were, as a whole, almost unrepresented. The notice given was too short; the undertaking was hurried; the project was quite new, and not clearly understood; and, moreover, most of the colonies were scarcely in a position to go to much expense for contributions. The East India Company, however, made a noble display, and some few of the British colonies a respectable appearance in 1851, and also at Paris in 1855. According to the latest official returns, the aggregate population of the colonies and possessions under British rule exceeds 195,000,000, of which the great bulk—185,000,000—are distributed over British India. In these colonies a total revenue is raised of

about £44,000,000, and the yearly value of the external trade—imports and exports—is upwards of £176,000,000. It appears from the official reports that out of 23,575 superficial feet of horizontal net space allotted to the British colonies in 1851, but 6180 feet were occupied. The only colonies then specially represented were—Canada, which made a good display; a few objects indirectly sent for exhibition from Nova Scotia, New Brunswick, Newfoundland, and Bermuda. From the West Indies a small collection was sent from the Bahamas, and a few odds and ends from Antigua and Barbadoes. Trinidad and British Guiana were well represented. Of the African colonies, the Cape was the only one that sent a collection; a few objects illustrating the products of St. Helena and the west coast of Africa were shown by London merchants and individual exhibitors in England.

Of the eastern colonies, the Mauritius sent but little; but a fair collection was transmitted from Ceylon.

In 1851 the Australasian colonies were but poorly represented, although a few made some efforts to put in an appearance. The New South Wales and Tasmanian collections were creditable, and a few things were sent from South Australia and New Zealand. With the exception of a small collection from Malta, this formed the aggregate of the colonial efforts.

At the Paris Exhibition in 1855, the few colonies that did send articles made a very satisfactory display. Canada especially obtained honour for its varied collections, which occupied upwards of 3000 feet of space, contributed by about three hundred and fifty exhibitors. Jamaica covered an area of about 500 feet, and British Guiana 350, whilst Bardadoes and the Bahamas were the only West Indian colonies that sent. Ceylon occupied nearly as much space as Demerara, and the Mauritius sent a small collection.

The Australian colonies on that occasion were very well represented, although one or two did not show. Two hundred and fifty-one exhibitors from New South Wales occupied 871 square feet; one hundred and eighteen exhibitors from Tasmania, 429 feet; thirty-six from Victoria, 289 feet; and ten from New Zealand, 117 feet. The official returns show that the twelve British colonies which exhibited products at Paris in 1855 filled about 500 feet more space than all the colonies which were represented in 1851.

Most of the industrial divisions in the Exhibition of 1862 were well filled by nearly all the colonies exhibiting, and the collection of raw produce is particularly rich and interesting. The Australian colonies exhibit one of the most extensive and finest collections of the whole group, and on the collecting, arranging, and despatching of these a very large amount of money has been expended.

New South Wales has a beautifully-arranged collection of its gold products from all the principal fields, in the several shapes of nuggets, quartz, grain gold, washing stuff, coin from the Sydney mint, &c. It sends an excellent assortment of Australian wines, the best of its wools and fleeces and cloth made from them, stuffed alpacas and the shorn fleeces of the flocks now in the colony, coal, minerals, native woods, and various agricultural produce and manufactures.

Queensland, which appears for the first time in Europe, has come forward most creditably with its ornamental and useful woods, wool, cotton, and tropical products.

South Australia is principally strong in its rich minerals, products of copper and lead, and malachite manufactures, and its wheat and flour, for which it has always been noted.

Western Australia also sends specimens of woods, in which it is especially rich, some of the spars and planks being very fine. Its other products assimilate to those already mentioned.

Victoria has gone to great expense to forward an enormous collection; the only difficulty being to find room for one-half of the goods sent. One of the most striking objects is a gilded obelisk representing the actual amount of gold found in the colony since 1851, about 800 tons, or £103,000,000 sterling. *Its manufactures and general industry are well represented, and a more extensive and varied collection has never before been sent from any British colony to Europe.*

Tasmania sends, besides its wool, manufactures, and agricultural produce, a noble trophy, rising 90 or 100 feet, made of its native woods, with a circular staircase in the interior; two whale-boats with all their gear are slung from it, and a fine native spar, surmounted with a flag, rises from the centre.

New Zealand sends from several of its provinces wool, wood, coal, gold, and agricultural produce."

There are one or two points of comparison between the Victorian Exhibition of 1861 and the present Intercolonial gathering of 1866, which will tend further to show a very gratifying march of improvement. The Exhibition of 1861 had an available area of 19,000 superficial feet; the present Exhibition-buildings and Courts occupy 56,240 feet, or nearly three times the area of the old Exhibition; every available foot of this space was occupied, the exhibits being in fact too much crowded, and the gangways too much encroached upon by goods, to render promenading agreeable on busy days.

At the Melbourne Exhibition of 1861, the gross cash receipts for admission, including season tickets, amounted to about £3400 for the period of 60 days and evenings during which the Exhibition was open. The gross number of persons admitted was 67,405. The sum of £60 was paid as a bonus for the sale of refreshments.

At the late Intercolonial Exhibition, the gross cash receipts for admission, including season tickets, from the 24th October, 1866, to the 23rd February, 1867, 105 days and evenings, have amounted to £9634 10s. The number of admissions registered was 268,634. The highest number on any one day and evening was 9586, and the lowest 817. The bonus given for the sale of refreshments was £550.

The experiment of admitting the public on Saturday evenings and Mondays at 6d., and children at half-price, proved eminently successful.

The number of exhibitors, the space occupied by, and the commendation given to the several colonies, at the Exhibition of 1862, were as follow :—

Colonies.	Number of Exhibitors.	Ground-Floor Area in Superficial Feet.	Number of Medals Awarded.	Number of Honourable Mentions.
Victoria	542	5665	111	84
New South Wales	470	2500	76	51
South Australia	77	1800	24	11
Queensland	93	1462	26	20
Western Australia	68	625	14	12
Tasmania	148	1600	26	26
New Zealand	113	625	33	10

At the Dublin Exhibition of 1865, the number of exhibitors stood thus :—

British division ...	788
Colonies ...	1050
Foreign states ...	1026
	2864
Fine Arts ...	1729
Total ...	4593

At the Dublin Exhibition of 1865 Victoria was the only Australian colony which exhibited anything like a complete collection. The number of exhibitors from this colony was 141, receiving 34 medals and 62 honourable mentions.

According to the *Official Catalogue*, the other Australian colonies represented were—Queensland, 6 exhibitors; New South Wales, 5 exhibitors; and South Australia, 2 exhibitors.

It may perhaps seem impertinent to contrast small things with great, but the splendid success of the late Intercolonial Exhibition really justifies a few other points of contrast.

In the Intercolonial Exhibition of 1866-7 we had :—

Victorian Exhibitors ...	1479
New South Wales Exhibitors ...	273
South Australian ,, ...	103
Queensland ,, ...	36
Tasmanian ,, ...	738
Western Australian ,, ...	196
New Zealand ,, ...	88
New Caledonia ,, ...	36
Netherlands-India ,, ...	3
Mauritius ,, ...	6
Total ...	2956

At the Great Exhibition of London, the Crystal Palace of 1851, the exhibitors in the

British division were	7,774
Other countries	6,345
Total	14,119

At the second Great Exhibition of London, in 1862, the number of exhibitors in the

British division was	10,299
Colonies	2,763
Foreign countries	21,228
Total	34,350

It will thus be seen that, amongst this group of colonies belonging to the British empire, we have managed to aggregate two-thirds as many exhibits as at the Exhibition of Dublin, one-fifth of the number of exhibits shown at the Crystal Palace of 1851, and a little more than one-twelfth of the number of objects displayed at the Great Exhibition of London in 1862.

Such gratifying results were not, however, achieved without labour, and for a time the most important feature of the scheme, viz., its truly intercolonial character, was barely secured. The authorities in New South Wales declined to give us any support, and the people of South Australia at the outset were almost as luke-warm, as has already been mentioned. Fortunately, however, for the credit of the enterprise, as well as to the credit of the colonies themselves, a better tone succeeded the first manifestations of indifference, and Dr. Bleasdale and Mr. J. G. Knight had the great satisfaction of discovering that amongst the communities of New South Wales and South Australia there existed kind and warm feelings of regard for the people of Victoria, which were not to be suppressed by the coldness of a few politically bilious individuals, who would fain have sent them back to Melbourne defeated and humbled for presuming to dictate to their seniors.

Of the Exhibition as it stood at its closing day, Victoria and the contributing colonies might well be proud. The varied products, the display of scientific, artistic, and mechanical skill, proved in a most striking manner not only the general existence of a highly-cultivated intelligence amongst the people of these colonies, but showed a strongly-marked progress of refinement when contrasted with the last local Exhibition of 1861.

To our neighbours in Tasmania belongs the credit of having at once heartily joined in the spirit of the Exhibition, and of having contributed

the most extensive and complete collection of natural products and artistic objects.

To Western Australia is due the highest commendation for the readiness which the authorities of that colony displayed in promoting the success of the Exhibition.

The Governor of New Caledonia is especially entitled to our gratitude for the very handsome manner in which he responded to the appeal of our Commissioners, and also for the valuable services rendered to the Exhibition by Messrs. Mathieu and Boutan, the gentlemen sent expressly from New Caledonia to represent that colony here.

The splendid collection of South Australian wines, fruits, cereals, and minerals, together with the beautiful specimens of workmanship in silver, the display of implements, and that admirable invention, Mr. Nitschke's distilling apparatus, presented, on the whole, a highly-interesting and characteristic group of exhibits.

New South Wales, the last to give her consent to join in our industrial festival, made good use of the little time at her disposal to make up a becoming collection of objects suggestive of the great resources of that most important colony. It is, however, to be regretted that the completeness of the New South Wales Court should have been so seriously marred as it was by the removal of goods for transmission to Paris.

A similar remark may be made with regard to the Queensland Department, as the best of her products were despatched from hence at an early period for the great French Exhibition of 1867. Many of such products will always find a better market in Melbourne than in Paris; but the desire of display overruled the more sober utilitarian purpose.

The contributions from New Zealand, although not quite so numerous as might have been expected, were nevertheless of a very interesting and instructive character. The highest praise is due to the authorities of Taranaki and Southland for their valuable collections of objects illustrative of the resources and industries of these provinces. To Mr. Thomas Kelly, of the former, and to Mr. J. H. Baker, of the latter, the especial thanks of the Intercolonial Commission are due for the great pains and trouble devoted by those gentlemen to promote the success of the Exhibition. In addition to forwarding a most appropriate series of exhibits, they have prepared reports on the capabilities of the above-named Provinces, and which, being full of useful information, are printed in connection with the other Essays and Reports published under the auspices of the Commissioners.

That the beautiful scenery of New Zealand should have found suitable

artistic illustration will not excite surprise. Hence some of the best of the pictures shown in the Exhibition were illustrative of the picturesque glories of these islands. The splendid paintings by Mr. Gully, the faithful and artistic works of Mr. Barraud, and the comprehensive collection of admirable sketches and drawings exhibited by Mr Chevalier, all tend to prove that New Zealand can vie with Tasmania in natural and scenic attractions.

A small but highly-interesting assortment of products was considerately forwarded from Netherlands-India, as well as some appropriate contributions from the Mauritius.

The attractions of the Exhibition were supplemented by three shows of flowers, fruits, and vegetables, under the management of the Horticultural Society of Victoria; the grounds of the Museum reserve, in the rear of the Exhibition, being well adapted for such botanical displays.

The acknowledged success and completeness of the late Exhibition is in a great measure due to the very general support which was accorded to the project by all sections of the Press, intercolonial as well as Victorian. Besides direct encouragement from their own pens, in no instance were any Exhibition notes forwarded to the papers without their being promptly and prominently inserted; and the writer of this is quite open to the conviction that very much matter which should *de rigueur* have gone into the advertising department, appeared in the economical and more attractive garb of general news.

The late arrival of so many, and, it may be said, of the most important contributions, necessarily delayed the proper classification and arrangement of the entire collection till a long time after the opening of the Exhibition, so that it was not before the 20th of December that the Jurors were first got together. Of the extent of their honorary labours, and of the manner in which they were performed, some idea may be gathered from an examination of the "Reports and Awards," which form so large a part of this volume; but in making a proper estimate of the work undertaken by the Jurors of the thirty-nine sections, due allowance must be made for the time and attention necessarily involved in examining the various objects prior to arriving at a final judgment upon them. The verdict upon an exhibit is usually given in two or three words, while the process of arriving at that verdict may have absorbed many hours, and even days, of investigation.

The work of the Jurors having been, in due course, brought to a close (with the exception of certain matters of revision subsequently attended to), the most important part of the business left to be disposed of by the

Commission was to make known the results of the examination of the several judges, and as the statements of any person officially interested in the success of the enterprise might possibly be regarded as partial, the following description is taken from the *Age* newspaper of the 15th of February, 1867 :—

THE DISTRIBUTION OF AWARDS.

The ceremony of Wednesday, although less brilliant than that on the opening day, was certainly more important. The first occasion was one of hope and promise ; the second, of realisation. The ceremonial being one of utility, perhaps of necessity, rather than form, it was conducted without any special parade ; and, indeed, although the assemblage was picturesque enough, being largely composed of gaily-attired ladies, the proceedings were uncommonly business-like, and unprotracted by any set speeches beyond a short address delivered by His Excellency the Governor. A carefully prepared plan of the business was issued and circulated for a day or two before, so that the actors and spectators might be fully informed with reference to the order of procedure, which was, first, the reading of a report upon the work undertaken by the Jurors, then a short reply by His Excellency, and, finally, the presentation by the Jurors of their several lists of exhibits. This was to conclude the regular business of the day with reference to the Exhibition ; but it had been decided to take the opportunity of the presence of His Excellency and the distinguished company to make a presentation of prizes to the successful competitors in the late Rifle Association matches. The ceremony had been arranged to take place in the open air, and within the enclosed reserve to the north of the carriage annexe. Two spacious marquees were erected for the accommodation of the ladies, and, between them, a covered way led from the annexe to the pavilion, which had been reserved for the accommodation of His Excellency and suite. The marquees were both crowded, and it was difficult to obtain standing room in the vicinity of the pavilion. The arrangements were, nevertheless, well conducted, and the visitors, both within and without the select circle, could all secure a good view. At about two o'clock His Excellency arrived, being accompanied by Lady Manners-Sutton and the Miss Manners-Sutton ; and the party were received by the Exhibition Commissioners at the Public Library entrance, from whence they were conducted through the Library and the Main Hall of the Exhibition to the scene of the ceremony. The national anthem was played by the combined bands of the Head-quarters and the 14th Regiment when His Excellency alighted from his carriage, and again upon

his arrival at the pavilion. His Excellency having taken his seat, Sir Francis Murphy, in a few appropriate remarks, introduced the Rev. J. J. Bleasdale, D.D., Executive Commissioner for Juries. Dr. Bleasdale then read the following report, explanatory of the work undertaken by the Jurors in connection with the Exhibition :—

"YOUR EXCELLENCY, LADIES, AND GENTLEMEN—

"As Special Commissioner for Juries, it has been deemed fitting that I should offer a few remarks on the manner in which the juries have been constituted, and the result of their investigations.

"Great pains were taken by the Commission to select and secure the services of men of acknowledged fitness to act as Jurors in the several subdivisions of the classes. It is my honourable and most agreeable duty to assure your Excellency, and ladies and gentlemen, that the Commissioners feel peculiar satisfaction and happiness in having secured the services of Jurors thoroughly reliable; and still more, that those gentlemen, whether resident in Melbourne or in the interior, have devoted an amount of care, time, and labour to their investigations which demands higher praise than is left in my power to bestow.

"The exhibits were ranged under six classes—'Mineral Products,' 'Animal Products,' 'Agricultural, Horticultural, and Indigenous Vegetable Products,' 'Manufactures and the Useful Arts,' 'The Ornamental Arts,' and 'Machinery.' These were divided into thirty-six sections and sub-sections. The number of jurors engaged in the investigation of the objects belonging to these divisions amounted to two hundred and twenty-four, several acting on more than one jury. To all these gentlemen I now, as Special Commissioner for Jurors, beg to tender public thanks.

"The List of Awards, to be handed to your Excellency, represents but a portion of the labours of the Jurors; as, in addition, they have already prepared, or have in course of preparation, reports full of interesting matter concerning the objects of their several sections. These will be published under my supervision, and issued to the public as quickly as possible, and then collected into a volume—not, it is to be hoped, without a permanent interest both here and in other countries. This will be the proper occasion for doing justice to the works of individuals, which, though good in many respects, were yet not deemed worthy of the *highest* distinction. One-half of the value of this Exhibition will be lost to the public if this permanent record be not rendered trustworthy in every sense.

"The awards now presented are in the main complete, and will not be altered. It is, however, possible that, with all the care bestowed by the Jurors, some objects of importance may have escaped notice. Should such be the case, I may undertake, on their behalf, to promise that they will still be open to consider such exceptional cases, and to deal with them in a supplementary issue.

"It may afford your Excellency some idea of the extent of the honorary labours undertaken by the Jurors, when I mention that they commenced their work of examination on the 20th of December, and have continued it without intermission up to the present day.

"Relying upon the accumulated experience of the authorities connected with the Great Exhibition of 1862, we decided that only one description of medal should be awarded for excellence wherever it was found, without reference to competition between exhibitors; and in cases where it was ascertained that articles possessed excellence of a kind which deserved a special mention, without, however, being up to the standard which would entitle them to a medal, it was determined to award them certificates under the title of *honourable mention.*

"The number of *medals* voted by the Jurors amount at present to 615, and the *honourable mentions* to about 674.

"It is personally gratifying to me to put on record that during the whole time I have had the pleasure of acting with the Jurors, nothing has transpired to mar the good feeling which they, in conjunction, as it seems, with all classes of the community, have evinced towards the success of this enterprise; and, as a proof of the appreciation of the public in this respect, I may inform your Excellency that since the opening of the Exhibition on the 23rd of October last up to the present day, there have been 242,892 admissions registered at the doors, and that the gross receipts, including 4674 season-ticket holders, amount up to date to £9120.

"I cannot conclude this short address without recording my most hearty thanks to our Secretary and Manager, Mr. J. G. Knight, who has been untiring in his efforts to assist the Jurors in their labours, and to whose talents, tact, and experience the success of the Exhibition owes so much.

"Before retiring, I beg one moments attention to a matter not altogether unconnected with this subject, viz., the future utilisation of these fine premises. May I hope that the public have now so thoroughly learned the value of an Exhibition that they will heartily co-operate in perpetuating this great national work as a permanent Exhibition—an ever-open and lasting exponent of our industries, our scientific discoveries, our onward progress in the exciting march of refinement and civilisation? Am I too sanguine when I wish and hope thus much for Victoria, under the blessing and guidance of that good providence of God which has, as we may piously believe, so abundantly seconded our efforts hitherto?

"JOHN J. BLEASDALE, D.D.,
"*Special Commissioner for Juries.*"

His Excellency the Governor made the following reply:—

"MR. EXECUTIVE COMMISSIONER—

"In expressing the satisfaction with which I receive from you this report of the mode in which the juries have been constituted, and of their proceedings, I wish to convey through you to the Jurors my very high appreciation of the spirit of self-devotion to the public service evinced by them in accepting duties so arduous and delicate as those which they have undertaken, and in devoting to the performance of these honorary duties their varied attainments and their valuable time.

"2. I fully concur in the estimate which you have formed of the services of the secretary and manager, Mr. Knight, whose duties, successfully discharged by him, have demanded general information, patience, energy, and industry, each and all in a very high degree.

"3. And if, on this occasion, I do not mention in succession the names of other gentlemen who have, in my opinion, entitled themselves to public approbation for their labours in connection with this Exhibition, it is because public opinion—not in this colony alone, but also in the neighbouring colonies and countries—has already pronounced the Exhibition a great and brilliant success. I, therefore, think it right to refrain from touching in particular on any one of the numerous topics of self-congratulation afforded by the Exhibition to those who planned it, supported it, contributed to it, and have rendered it a success.

"4. But before I proceed, in accordance with the request of the Commissioners, to distribute to the exhibitors the awards of the Jurors, I desire to express my full and entire concurrence in the opinions set forth in your report, that the permanent value of the Exhibition would be materially impaired, and that full justice would not be done to the exhibitors, if a record, trustworthy in every sense, were not preserved of the numerous and varied exhibits which, although not deemed worthy of the highest distinction, are yet meritorious, with the explanatory remarks and detailed information which the Jurors in each section and sub-section are so well qualified to afford on the subjects referred respectively to them.

"5. And for the colonies and communities who have contributed to this Exhibition I anticipate, from the publication of the Reports (now in preparation) of the Jurors, not only additional proofs of the already recognised richness of this collection of specimens of natural wealth and of industrial products, but a new stimulus here to industrial and scientific progress, and an enhanced reputation throughout the world, both for natural resources and the power of developing those resources."

The Executive Commissioner then proceeded to introduce to His Excellency the Chairman of each Section, who presented the list of awards appertaining to his division. At the conclusion of the ceremony, the band of the 14th Regiment and the Head-quarters Band played a selection of appropriate music, and thus terminated that part of the day's proceedings relating to the Exhibition.

THE CLOSE OF THE EXHIBITION.

The Exhibition was brought to a successful termination on Saturday, the 23rd of February, 1867, and the *Argus* of the following Monday furnished the subjoined account of the proceedings which concluded the undertaking:—

The Exhibition-building presented a very gay and busy appearance on Saturday evening, and there had been more than an average attendance throughout the closing day. The band of the 14th Regiment played both in the afternoon and evening, relieved by performances on the organ by Mr. Horsley and other musical professors. Some of the exhibits had been

removed, but there were many among the visitors to be observed scanning the merits of the most remarkable of the objects still on view with an eagerness and curiosity that betokened a first, although very late, visit to this collection of natural and industrial objects, which has been so creditable to colonial enterprise. The actual closing was deferred until half-past ten o'clock, and the visitors at last seemed to quit the building with great reluctance. Shortly after ten o'clock the Rev. Dr. Bleasdale addressed those present in a brief and appropriate valediction on the high purposes of the undertaking as follows:—

"Ladies and Gentlemen—In a few moments more the Intercolonial Exhibition will be numbered with things that have passed away. It has been open exactly four months, during which time we have registered 270,440 visitors, including, of course, the holders of season tickets. The average daily attendance has been 2360. The total receipts for admissions amount to £9600, besides the amount received to-day. Considering the length of time it has been open, and the vast variety and value of the exhibits, and the crowding of the buildings on several occasions, scarcely any damage has been done to anything, and nothing has been stolen. I have much pleasure in thanking the police, both officers and men, for the admirable manner in which they have watched and guarded both the buildings and their contents. Ladies and Gentlemen—One moment more, and I have done. I feel there will be no second opinion about what I am going to say. This Exhibition has been a fair exponent of our own internal and intercolonial resources of all kinds; and, I may be bold to say, has drawn the cords of sisterhood closer together. Thousands of people have learned a vast deal more about Australasia during the past four months than they had acquired in years before; and, let me hope, have been strengthened in the feeling that if some dire calamity—which Heaven avert—should separate us from our parent country, we shall soon be in a position to supply ourselves with the necessaries and conveniences of life, as well as its luxuries and refinements. All honour, then, to the mind which gave practical effect to the idea of holding this Exhibition, to the Ministry that favourably entertained it, and to the Parliament of the country that granted such ample funds to carry it out; aye, and to the public both of this and our sister colonies, for the lively interest and sympathy shown with the undertaking. May the Divine blessing accompany our efforts in the future, and promote union and brotherly love in the bond of peace throughout the whole of these rising nations."

Mr. J. G. Knight, the energetic Secretary to the Commissioners, was then loudly called for, and after a few remarks from him, the proceedings, for which no formal preparation had been made, terminated with the military band playing the National Anthem.

The number of visitors on Saturday was as follows:—Season Pass Tickets—Morning, 890; Prahran Wesleyan Sunday School, 33; evening, 584. Cash Admissions—Morning, 1205; evening, 2213. Total, 4925.

Thus terminated the first Intercolonial Exhibition of the Australian and neighbouring friendly colonies. Whatever may have been its defects or shortcomings, it cannot be denied that the enterprise was exceedingly popular, for the interest therein continued unabated for four consecutive months. It may also be claimed as an almost unprecedented circumstance in colonial history, that from first to last not one adverse or deprecatory criticism upon the Exhibition appeared in any portion of the Australian Press. Since the close of the undertaking a few questions have, however, been raised as to the effects and results of the enterprise—questions which, it is submitted, are asked a little too soon. The benefits conferred on the community at large by the first Great Exhibition of 1851 were not made manifest until the Crystal Palace was reconstructed at Sydenham. The dawn of art workmanship of blending beauty with utility, which was but faintly indicated in the British department of the Exhibition of 1851, became developed into an astounding demonstration of progressive refinement in 1862, time and opportunity being the essential elements of success in all such matters. It is not, therefore, to be expected that any immediately profitable results can be attributed to the late intercolonial gathering, nor is it to be presumed that an Exhibition will for itself create any wonderful skill or surpassing intelligence.

It is possible to expect too much from these undertakings, and those who are so exacting will necessarily be disappointed. The Exhibition which so recently closed contained within its several courts the best samples of colonial productions which the colonies were at the time capable of bringing forward. In some of the sections the exhibits were manifestly excellent, in others they were indifferent, but with a few exceptions the articles displayed indicated the condition of the industry at that particular date, and the practical lessons taught thereby were as valuable when they suggested censure as when they extorted praise.

In one branch of the mechanical arts there was undoubtedly a great weakness, one which our American cousins are so happy in dealing with, viz.—labour-saving machines. It is no reflection, however, on the merits or value of the Exhibition that such economic devices were not generally displayed; it rather indicates the absence of proper attention to the production of appliances for saving labour, and suggests a field of operations in that branch of industry. Exhibitions such as ours are land-marks of our progress, the registration being high or low just in proportion as we are wise, truthful, and prosperous.

It will scarcely be supposed that the labours of the Commission terminated at the close of the Exhibition. The delivery of the large collection of objects contributed by the numerous exhibitors necessarily spread over a considerable time, while the jury department remained engaged in looking into such cases as had escaped previous notice, and in revising those awards against which appeals had been lodged by the competitors. The period thus occupied was not, however, misapplied, for a number of additions were made to the list of medals and honourable mentions, so that the Reports and Awards now published are in a much more complete and satisfactory form than on the day when the awards were formally declared. It is scarcely to be expected that even in their present condition the decisions of the Jurors will give entire satisfaction. In such matters it is impossible to do complete justice to all. Unfortunately there will always be a certain percentage of good work overlooked or unappreciated, but it is hoped that in the present instance the errors and omissions are very few in number. For these, however, the Commissioners are not to be held responsible; the Jurors were perfectly independent, and their adjudications have been in no way interfered with.

The labours of the Jurors having been brought to an end, and the re-delivery of the goods being concluded (with a few trifling exceptions), the Commissioners were enabled to submit a final statement of the results of the Exhibition, together with an account of ways and means, in an address, presented to the Governor on the Queen's Birthday, May 24th, at the termination of the levee held by His Excellency in the building:—

"May it please your Excellency,

"We, the Commissioners appointed for the management of the Intercolonial Exhibition, consider it our duty to lay before your Excellency a short report connected with such management.

"2. Before entering into details, we must acknowledge how much we are indebted to your Excellency for your presence on several occasions, and for having taken so constant and warm an interest in the progress and success of the Exhibition.

"3. As your Excellency is already aware, the Exhibition opened on Wednesday, the 24th day of October, 1866, and closed upon Saturday, the 23rd day of February, 1867, having been open for 105 days.

"4. There were special Courts arranged for Victoria, New South Wales, South Australia, Queensland, Western Australia, Tasmania, and New Zealand, as also for the French settlement of New Caledonia; and Commissioners from the several dependencies were present, assisting constantly and warmly in our common purpose.

"5. There were also Courts set apart for the collections of several of the Victorian country districts—as, Ballarat, Beechworth, Sandhurst, Castlemaine, Wangaratta, Dunolly, &c.

"6. The number of exhibitors from the respective colonies were as follows :—

Victoria	1479
New South Wales	273
South Australia	103
Queensland	36
Western Australia	196
Tasmania	738
New Zealand	88
New Caledonia	36
Netherlands-India	[illegible]
Mauritius	6
Total	2956

"7. The awarding of medallions and honorary certificates was entrusted to 39 juries, consisting of 224 gentlemen, whose duty it was to examine the exhibits through the different classes and sections; and not only was this delicate and difficult task performed, but valuable reports on the different manufactures coming under their notice have also been contributed, and which now form a part of our Official Record.

"8. There was also formed a Council of the Chairmen of the different Juries, to consider with reference to awarding fifty medallions given for special merit by the Commissioners.

"9. The medallions and certificates distributed under the presidency of your Excellency were as follows :—

	Medallions.	Hon. Certificates.
Victoria	398	388
New South Wales	80	64
South Australia	84	30
Queensland	8	5
Western Australia	18	23
Tasmania	72	89
New Zealand	22	22
New Caledonia	10	17
Netherlands-India	5	6
Mauritius	1	2
Total	648	646

"10. The season-ticket-holders numbered 4224, paying the amount of £3004 15s., and the gentlemen availed themselves of their privilege by visiting the Exhibition on 46,589 occasions; the ladies, 39,750; and the children, 5956.

"11. The passes paid for at the door numbered 150,896, and amounted to £6629 15s.

"12. The visits of those permitted to enter free—viz., exhibitors on special occasions, members of the Horticultural Society at their shows, members of the orchestra, and persons classed under charitable institutions and schools, numbered 25,443, making in all 268,634.

"Taking the total number of visitors, when compared with our population, it shows that there have been about two visits to every five of the population, while the exhibitors are about one to every two hundred of the same; showing a comparatively larger proportion of attendances than is to be found, as we believe, in the statistics of any Exhibition.

"13. These and other interesting facts may be found in the tables of statistical information which we have the honour to submit.

"14. We have also the honour to present to your Excellency copies of

our Official Record, of near 1000 pages, containing an Historical Introduction, the Catalogue of Exhibits, the Awards of Jurors and of the Jury of Chairmen, the Reports of the Juries, and a series of Essays on the social, natural, and economic resources of the Australasian colonies, which must be considered of great value.

"15. We also present to your Excellency a series of photograms, illustrative of the Exhibition.

"16. Accompanying this address will also be found copies of our accounts as examined by the Commissioners of Audit, with particulars of attendances, &c., &c.

"17. We are satisfied that these several documents will be received by your Excellency with satisfaction; and now, as we are about to close our labours, we sincerely trust, in the expressive language of your Excellency, "that they may conduce to the material prosperity of each of the communities whose industries were represented, and promote friendly sympathy and mutual co-operation between all who took part in the Intercolonial Exhibition."

"Signed upon the part of the Commissioners,

"SAMUEL H. BINDON,
"*Acting Chairman of Finance Committee.*"

To the above address His Excellency Sir J. H. T. Manners-Sutton made the following reply:—

"Mr. Chairman and Gentlemen—

"I have on previous occasions gladly availed myself of the opportunities afforded to me of congratulating you on the success which has attended your labours, and of expressing to you my hearty recognition of the services which you and those connected with you in the conduct of the Intercolonial Exhibition have rendered, not only to the Government and public of this colony, but also to the cause of scientific and artistic industry in this part of the world.

"And it might perhaps appear at first sight that, in receiving and thanking you for this address, it only remained for me to reiterate my congratulations, and to repeat the expression of my appreciation of your services; and, gentlemen, once more I do most heartily congratulate you on the success of your exertions, and once more I assure you that your valuable services are most highly appreciated by me.

"But although the Intercolonial Exhibition is now closed, and belongs, in one sense, to the past, I am convinced, and I rejoice in the conviction, that it continues, and will continue, to exercise an important influence in promoting the objects for which it was instituted. And, while you are entitled to contemplate, with that feeling of satisfaction which accompanies and rewards the faithful performance of arduous duties, the successful termination of your past labours, you may, I feel sure, look to the future for a still more extended development of the beneficial results of those labours, and of the great industrial enterprise with the management of which you have been entrusted.

"I will not now revert to the varied richness of the exhibits collected and displayed in the Exhibition under your auspices, otherwise than to express the satisfaction which I feel in the assurance that their value, as evidences

of natural wealth and of industrial skill, is illustrated, and has been recorded in the documents which are now submitted to me.

"The very remarkable, and, I believe, unprecedented—in proportion to the population—number of those who have testified their personal interest in the Exhibition by visiting it, justifies the belief that these Reports, and the lessons to be learnt from them, will be fully appreciated here and in the neighbouring colonies and countries; and I anticipate from their circulation elsewhere no less important results.

"For myself, Mr. Chairman and Gentlemen, I desire to assure you that, although it was not my privilege to be associated, either personally or officially, with the proposal that an Intercolonial Exhibition should be held here—and while I cannot claim any share of the credit which belongs to those by whose exertions it has been rendered a success—my connection, slight as it has been with the Exhibition, invests with additional value the records which you have been good enough to present to me, and will always be remembered by me with sincere gratification."

It is but proper in this narrative to make official record of the consideration and liberality of those public bodies and private firms who afforded substantial gratuitous aid to the cause of the Exhibition.

The Railway Department gave free carriage of goods by the Government lines, and the Melbourne and Hobson's Bay Railway Company conceded a like privilege; Messrs. Cobb and Co. allowed their coaches to carry parcels free; the Peninsular and Oriental Steam Navigation Company, Messrs. M'Meckan and Blackwood, the Australian Steam Navigation Company, the Tasmanian Steam Navigation Company, and the Otago Steam Navigation Company, deserve the thanks of the community for conveying the contributions of the several colonies freight free.

The Hon. the Chief Secretary was equally considerate, and conceded the very acceptable boon of franked stamps for all postal correspondence.

The Commissioner of Trade and Customs (Hon. J. G. Francis) afforded every possible facility for the admission of dutiable goods from the other colonies, as well as kindly supplying the tables of imports which are quoted in connection with the Reports of the Jurors; while Mr. C. J. Claridge most obligingly gave his gratuitous services as Custom House agent to the Commissioners, an office which involved a considerable sacrifice of time as well as the exercise of great patience.

The Commissioner of Public Works (the Hon. W. M. K. Vale) obligingly consented to allow free use of the Yan Yean water for the fountains and water engines; while the Borough and Shire Councils furnished banners for the decoration of the Hall, and beautiful collections of

photograms illustrating the scenery and most important buildings of the various districts. The Corporation of Melbourne gave prompt and useful aid, not only by presenting a magnificent photographed panoramic view of the city, but also by making suitable approaches to the Exhibition, and providing additional gas lamps for the benefit of the evening visitors; and it may with truth be said that all sections of the community evinced a kindly regard for the success of the enterprise.

As it is sometimes the habit of critics at a distance to reflect on the tone of Australian society, it is only fair to ourselves to give the following extract from Mr. Inspector Sadleir's official report, in which he says:—"There was little disorder of any kind, nor did I observe more than two or three persons among the visitors who had the appearance of intoxication during the whole time the Exhibition was open. Indeed, nothing could be more creditable than the uniform good conduct of the numerous visitors to the Exhibition."

Some suggestions have already been thrown out with reference to the holding of the next Intercolonial Exhibition, and it has been mentioned that, as the Centenary of the Foundation of New South Wales will be in 1870, it would afford a most fitting opportunity for holding the second Exhibition at Sydney in the course of that year. Should such be the case, the people of New South Wales may doubtless rely on the cordial support of Victoria, as well as of those colonies which have come forward so well on the present occasion.

Having acquired some experience in connection with Exhibitions, we may perhaps venture, in conclusion, to offer a few suggestions with reference to the internal arrangements of such institutions.

1. In the general plan of an Industrial Exhibition, especial care should be taken to make all parts of the edifice equally attractive. If the design embraces one feature of peculiar beauty, all the exhibitors will naturally be clamorous to have a place in it, and the great mass who are excluded will be jealous and dissatisfied.

2. Every exhibitor considers that his particular goods are entitled to the greatest prominence—hence the perfection of a design for an Exhibition-building would be one all centre, and without sides, aisles, ends, or out-of-the-way corners.

3. Annexes and secondary buildings should, if possible, be avoided, excepting, of course, for machinery, or such processes of manufacture as require working illustration.

4. Ample space should be reserved for promenade and for seats throughout the building. In the late Intercolonial Exhibition the great demand for space for exhibits rendered this impossible, without rejecting a large number of important contributions.

5. Due provision should be made, if possible, for short explanatory lectures calculated to stimulate enquiry, and musical performances should not be forgotten, as all are essential to ensure the completeness of enterprises of this nature. The greater the attendance the greater will be the success of Industrial Exhibitions, and all legitimate means may fairly be resorted to to promote that end.

6. It is unnecessary and out of place to attach ultra-scientific interest or sentiment to these industrial gatherings. The great aim of an Exhibition is to give the fullest possible notoriety to new manufactures and processes, and bring the manufacturer and inventor more closely in contact with the merchant, speculator, and capitalist; and, by this most practical method of advertising, to enlarge the basis of trade.

INTERCOLONIAL EXHIBITION OF AUSTRALASIA, 1866-67.

BALANCE SHEET FROM DATE OF APPOINTMENT OF THE COMMISSION, OCTOBER 27, 1865, UP TO THE CLOSING DAY, AS FURNISHED TO THE AUDIT COMMISSIONERS.

Dr. **Receipts.**

1865-6-7.						
To Amount received from the £5000 voted by Parliament towards Preliminary Expenses				£4,000	0	0
" Receipts from first Concert				88	14	3
" " Season Tickets				3,004	15	0
" " Cash Admissions				6,629	15	0
" " Premiums—						
Refreshment	£550	0	0			
Photographer	50	0	0			
				600	0	0
" " Paris Exhibition—Repayment of Voucher 144 for this amount, paid for Paris Commission				40	10	0
" " Repayment of Voucher 207				0	18	0
" Surplus arising from two small errors				0	2	4
				£14,364	14	7

Cr. **Expenditure.**

By Building Account, including Gas and Water Fittings, and other Permanent Works, as per Schedule A and Vouchers										£4765	15	6
" Cases and Furniture, as per Schedule B										758	17	4
" Fittings " " C										698	9	11
" Banners " " D										28	5	0
" Frames " " E										33	9	6
" Dr. Mueller, Specimens of Wood F										175	0	0
" Dr. Bleasdale, Minerals										30	0	0
" Repaid Treasury										0	1	9
Total represented by Assets										£6489	19	0
Incidental and Maintenance, viz.:—												
Gas to date										622	8	7
Salaries of Staff, from November, 1865										2857	14	4
Wages										300	8	1
Insurance										119	19	6
Advertising, Printing, &c., Schedule G										1279	15	9
Machinery employed										334	5	5
Miscellaneous, Schedule H										892	18	6
Music, at Concerts										618	8	6
Concert and Organ										175	0	0
Due for Season Tickets							£9	9	0			
Unpaid in small amounts							1	11	3			
										11	0	3
" Balance in Bank, Receipts							£1407	4	0			
Less General Balance				£46	8	9						
Cheques not presented				697	18	7						
							744	7	4			
										662	16	8
Submitted to the Audit Commissioners on the 15th February, 1867.										£14,364	14	7

SUPPLEMENTARY BALANCE SHEET, FROM 25TH FEBRUARY TO 25TH APRIL, 1867.

Dr. **Receipts.**

1867.				
Feb. 25.	To Balance, per Balance Sheet	£662	16	8
28.	" Receipts, 25th, 26th, and 27th February, from Admissions after the Closing	29	4	6
Mar. 30.	" Interest Account Current National Bank	35	3	0
April 15.	" Proceeds of Tickets for Opening Concert sold by Wilkie, Webster and Co., now returned	4	0	0
	" Balance down	44	16	2
	" Balance from Tickets, as per Balance Sheet No. 1	1	11	3
		£777	11	7

Cr. **Expenditure.**

1867.			
By Building Account, including Gas and Water Fittings, and other Permanent Works, as per Schedule A (No. 2)	£63	3	6
" Cases and Furniture, as per Schedule B (No. 2)	9	0	0
" Frames for Photographs, as per Schedule E (No. 2)	10	13	0
" Incidental and Maintenance:—			
Balance of Gas Account to date	58	8	7
Salaries of Staff	279	19	11
Wages	62	13	3
Insurance	1	5	0
Printing, &c., as per Schedule G (No. 2)	115	3	6
Machinery employed	8	5	0
Miscellaneous, including £100 for Modelling Medallion H (No. 2)	167	0	2
" Interest in Account Current with Bank	1	19	8
Submitted to the Audit Commissioners, 6th May, 1867.	£777	11	7
By Balance	£44	16	2

GENERAL BALANCE SHEET, BEING No. I. AND SUPPLEMENTARY BALANCE SHEET UNITED.

Dr. Receipts.		
To Amount Received from the £5000 voted by Parliament towards Preliminary Expenses		£4,000 0 0
„ Receipts from first Concert, with £4 paid by Messrs. Wilkie since last Balance Sheet		92 14 3
„ Receipts from Season Tickets		3,004 15 0
„ „ Door „		6,629 15 0
„ Premiums—		
Refreshments	£550 0 0	
Photographers	50 0 0	
		600 0 0
„ Repayment by Paris Exhibition Commission of Voucher 144, for this amount paid for Paris Commission		40 10 0
Repayment of Voucher (cancelled) 207		0 18 0
„ Surplus arising from two small errors		0 2 4
Receipts, 25th, 26th, and 27th February, after Closing (see Supplemental Balance Sheet)		29 4 6
„ Interest allowed on Account Current to March 30th		35 3 0
„ Balance down		44 16 2
		£14,477 18 3

Cr. Expenditure.	
By Building Account, including Gas and Water Fittings, and other Permanent Works, as per Schedule A (Nos. 1 and 2)	£4,828 19 0
„ Cases and Furniture, as per Schedule B (Nos. 1 and 2)	767 17 4
„ Fittings „ „ C	698 9 11
„ Banners „ „ D	28 5 0
„ Frames „ „ E (Nos. 1 and 2)	44 2 6
„ Dr. Mueller „ „ F	175 0 0
„ Dr. Bleasdale, for Specimens of Gems	30 0 0
„ Treasury	0 1 9
Total represented by Assets	£6,572 15 6
„ Incidental and Maintenance, viz.:—	
Gas to date	680 17 2
Salaries of Staff, from November 1865 to date	3,137 14 3
Wages	363 1 4
Insurance	121 4 6
Advertising, Printing, &c., as per Schedule G (Nos. 1 and 2)	1,394 19 3
Machinery employed	342 10 5
Miscellaneous, H (Nos. 1 and 2)	1,059 18 8
Concert and Organ	175 0 0
Season Tickets not yet accounted for	9 9 0
Music at Concerts	618 8 6
„ Interest Account Current with Bank	1 19 8
	£14,477 18 3
By Balance down	£44 16 2

ESTIMATED STATEMENT FOR FINAL CLOSING OF ACCOUNT.

Liabilities.	
National Bank Overdraft	£44 16 2
Printing 750 vols., about 1000 pages, about	450 0 0
Medallions, about	350 0 0
Photographs	155 0 0
Decorating Hall, &c.	50 0 0
Printing Honourable Mention Cards	50 0 0
Contingent and unforeseen Expenses in finally closing	750 0 0
	£1849 16 2
As against the Above.	
Amount not received on £5000 voted by Parliament, lapsed last year	£1000 0 0
Premium on Printing Official Catalogue	50 0 0
	£1050 0 0
Debit to Parliamentary Grant.	
Amount voted by Parliament	£5000 0 0
Balance required	800 0 0
	£5800 0 0
Credit to meet Above.	
Amount expended on Premises, not originally contemplated, as per Schedule A, and surrendered to H.M. Government	£4828 19 0
Cases, Furniture, Fittings, Banners, Frames, Specimens, as per Schedules B, C, D, E, F, all handed over to H.M. Government	1743 18 8
Official Record, containing Essays, Catalogues, Rewards, Reports, &c., at cost price, being 750 copies of 1 vol., for distribution	550 0 0
Photograms of the Courts of the Exhibition, for distribution	155 0 0
	£7277 17 8

AVERAGE RECEIPTS

(Including Current Sales of Season Tickets).

			£	s.	d.
Amount received for Season Tickets prior to 25th of October			£2332	5	[illegible]
Oct. 25 to 27, 1866	3 Days	..	607	14	9
29 to Nov. 3 ..	6 ,,	..	717	[illegible]	3
Nov. 5 to 10 ..	6 ,,	..	857	11	0
12 to 17 ..	6 ,,	..	456	0	3
19 to 24 ..	6 ,,	..	502	6	6
26 to Dec. 1 ..	6 ,,	..	442	10	[illegible]
Dec. 3 to 8 ..	6 ,,	..	353	9	6
10 to 15 ..	6 ,,	..	287	9	6
17 to 22 ..	6 ,,	..	250	0	9
24 to 29 ..	6 ,,	..	570	18	0
Dec. 31/66 to Jan. 5/67	6 Days	..	£464	13	9
Jan. 7 to 12 ..	6 ,,	..	353	12	3
14 to 19 ..	6 ,,	..	228	12	0
21 to 26 ..	6 ,,	..	211	8	0
28 to Feb. 2 ..	6 ,,	..	196	18	6
Feb. 4 to 9 ..	6 ,,	..	146	2	6
11 to 16 ..	6 ,,	..	252	12	0
18 to 23 ..	6 ,,	..	403	5	6
			£9634	10	0

Average per Week—17½ Weeks, from 25th October £417 5 4

ABSTRACT OF ATTENDANCE.

Date.	No. of Days.	Season Tickets.	Free Passes to Exhibitors, Orchestra, Charities, Schools, &c.	Paid at Door.	Weekly Totals.
1866.					
Oct. 24 to 27 ..	4	7080	40	7,013	14,133
29 to Nov. 3 ..	6	6860	484	11,974	19,318
Nov. 5 to 10 ..	6	7151	925	17,401	25,477
12 to 17 ..	6	4385	832	9,644	14,861
19 to 24 ..	6	5508	1,017	11,042	17,567
26 to Dec. 1 ..	6	5267	952	9,735	15,954
Dec. 3 to 8 ..	6	5092	1,007	7,740	13,839
10 to 15 ..	6	4022	906	6,437	11,365
17 to 22 ..	6	4023	969	5,468	10,460
24 to 29 ..	6	6111	962	12,008	19,081
31 to Jan. 5/67	6	5034	1,152	9,857	16,043
1867.					
Jany. 7 to 12 ..	6	5466	1,286	6,498	13,250
14 to 19 ..	6	4419	997	5,982	11,398
21 to 26 ..	6	3743	1,125	5,673	10,541
28 to Feb. 2 ..	6	4449	751	4,306	9,506
Feb. 4 to 9 ..	6	3006	3,338	4,481	10,825
11 to 16 ..	6	5[illegible]46	4,077	5,971	15,294
18 to 23 ..	6	5433	4,623	9,666	19,722
	106	94,304	25,443	150,896	268,634

CERTIFICATE FROM MESSRS. REED AND BARNES.

Statement of Builders', Gasfitters', and other work done by the Exhibition Commissioners towards completing and fitting-up the Exhibition Building on the permanent foundations.—Amount, £3410 18s. 8d.*

REED & BARNES, *Architects.*

* *This sum does not include the two Iron Annexes.*

SAMUEL H. BINDON }
CHARLES E. BRIGHT } *Finance Committee.*
GEORGE HARKER }

INTERCOLONIAL EXHIBITION OF AUSTRALASIA, 1866-67.

CATALOGUE OF EXHIBITS.

INTERCOLONIAL EXHIBITION, 1866.

OFFICIAL CATALOGUE.

NOTE.—The numbers in the Catalogue correspond with the numbers on the Cards of the Exhibitors, but in the various Courts it will be necessary to refer, not only to the number in the Catalogue, but also to the name of the Court, which will be found prominently displayed.

Class I.—Mineral Products.

SECTION 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Limes, Cements, Clays, Salt.*

1 ALLISON, MR.—No. 1 Water Brick: pressure on brick 45 tons, fracture just perceptible; from 46 to 57 tons, fracture gradually increasing; 58 tons, fracture all over; no perceptible difference between the brick which had been tested by water and the one tested dry. No. 2 Water Brick: pressure on brick 45 tons 10 cwts., fracture perceptible; 60 tons 12 cwts., fracture hardly increased. No. 1 White Building Brick: pressure on brick 46 tons 16 cwts., fracture perceptible; 60 tons 12 cwts., fracture increased, but brick not at all splintered. No. 1 Brown Building Brick: pressure on brick 52 tons 16 cwts., fracture perceptible; 60 tons 12 cwts., fracture gradually increasing.

1a ALLISON, R., *Digger's-rest Station.*—Artificial Stone, Fire and Building Bricks.

2 ARARAT SHIRE COUNCIL.—Volcanic Stone.

3 BAND OF HOPE COMPANY, *Ballarat.*—A Pyramid representing the Gold procured from the Claim from the 25th May, 1864, to the 21st September, 1866—97,652 ounces.

4 BANK OF AUSTRALASIA.—Specimens of Gold from the various goldfields—value, £4634. No. 1—Nugget, 62 ozs. 6 dwts. 6 grs., from Break-o'-Day Company, Rokewood; 2—Nugget, 109 ozs. 19 dwts., ditto; 3—Nugget, 116 ozs. 10 dwts., ditto; 4—Twelve Pieces, 45 ozs. 4 dwts., ditto; 5—Nugget, 46 ozs. 10 dwts., ditto; 6—Nugget, 86 ozs. 15 dwts., ditto; 7—Nugget, 18 ozs. 11 dwts., ditto; 8—Six Pieces, 21 ozs. 16 dwts., ditto; 9—Ten Pieces, 65 ozs. 11 dwts., and Small Nuggets, 83 ozs. 2 dwts., Grant and party, Rokewood; 10—Six Pieces Alluvial, 58 ozs. 10 dwts., and 41 ozs. 10 dwts., Happy Valley; 11—Nuggets, 7 ozs. 18 dwts., Ballarat. Alluvial Gold, various, as follows:—Ballarat—Albion Company, 258 ozs. 5 dwts.; Smythesdale, 10 ozs.; Creswick, 20 ozs.; Beechworth, 10 ozs.; Beechworth, 5 ozs.; Bright, 10 ozs.; Yackandandah, 10 ozs.; Castlemaine, 10 ozs.; Talbot, 10 ozs.; Blackwood, 10 ozs.; Sandhurst, 10 ozs.; Tasmania—Fingal, 1 oz.

4a BANK OF VICTORIA, *Melbourne.*—Specimens of Granulated Silver, and ingots of Silver, from St. Arnaud's; Sample of Granulated Gold. In gold case.

5 BATES, THOMAS, JUN., *Clifton, Drysdale.*—Fuller's Earth. From the property of Exhibitor.

6 BLEASDALE, REV. J. J., D.D., F.L.S.—One Case of Colonial Gems, both cut and polished and in the rough, contrasted with the same character of Gems from other parts of the world. Collected by Exhibitor. For Exhibition only.

7 BOOL, RICHARD, *Kyneton.*—Columbine Stone. Cut and dressed by Exhibitor.

8 BOROUGH COUNCIL OF CLUNES.—Samples of Quartz from the Mines of Clunes.

9 BOROUGH OF TARNAGULLA.—Specimens of Auriferous Quartz, Crystals, &c.

10 BROWN, J. W., *Madeline-st., Carlton.*—Headstone, and Enclosure with an Improved Mode of Fastening.

11 BURROWS AND MAXWELL, *Muckleford, Castlemaine.*—Slate from Town Reef; White Clay from same place.

12 BURROWS, JOHN.—One Slate Stone, Two Specimens of Variegated Clay Slate.

13 CHAPLIN, E., *Manager of St. Arnaud Silver Mines.*—Section of the St. Arnaud Silver Lode.

48 ROBERTSON, WILLIAM, *Marble Quarry, Calliope River, Port Curtis*—Two Blocks Marble.

49 ROBINS AND ALLISON.—Five Boxes Minerals.

50 SHIRE COUNCIL, *Hampden*.—Collection of Minerals and Woods.

51 SMYTH, R. BROUGH, *Secretary for Mines*.—Specimen of Coal from Cape Paterson. Presented to the Mining Department by Thomas Bury, Esq.

52 SMYTH, R. BROUGH, *Secretary for Mines*.—Mineral Rocks and Fossils collected in the colony, 526 Specimens; Auriferous Quartz from the several Quartz Reefs of the colony, 279 Specimens; Foreign Minerals and Rocks in the Collection of the Mining Department, 1006 Specimens—total, 1811 Specimens. The specimens are numbered, and each has a label, on which is written the corresponding number, the name, the locality, the donor's name, &c.; and printed catalogues have been prepared to facilitate reference.

53 SMYTH, R. BROUGH, *Melbourne*.—Seven Slabs rough Slate.

54 SPENCER, HENRY, *Hawthorn*.—Building Bricks, Coping Bricks, and Brick Clay.

55 STAWELL SHIRE COUNCIL.—Specimens of Quartz; Sandstone; glass case containing Auriferous Specimens; Freestone Font; and Bricks.

56 STIRLING, MR., *Richmond*.—Fire Clay and Pottery.

57 TAYLOR, J. P., *Superintendent, Southland*.—Sample Gold from Eyre Creek; Nugget of Gold from Longwood Range.

58 THE BOROUGH COUNCIL OF ST. ARNAUD.—Granite from Yowen Hill, Stone from Daliammy Creek, Limestone and Lime, Cope Bricks.

59 THOMPSON, W. J., 3 *Little Collins-st. W.*—Victorian Lignite and Splint Coal.

60 THORBURN, HENRY—One large Flagstone from the Castlemaine Paving Company.

61 URQUHART, T. G., *Rowena-parade, Richmond*.—Arragonite—specimens from the Woady Yalloak Extended Gold Mining Company's claim, Pitfield.

62 WATT, CHARLES, *East Melbourne*.—Steel Sand, from New Plymouth, New Zealand; Specimen of Steel manufactured of said Sand.

63 WAUGH AND LEIBOUF, *Oxford-st., Collingwood*.—Architectural Dressings of Artificial Stone. Invented and produced by Exhibitor.

64 WEBBER, CHARLES, *Dunolly*.—Specimens of Steatite, and Two Pipes and a Pyramid made from Steatite.

65 WHITE, JOHN, *Footscray*.—Stone Fossil Tree. Found by Exhibitor in his Quarry, at Footscray.

SECTION 2.—*Chemical and Metallurgical Products and Processes.*

66 BULL, J. W., 38 *Yarra-st., Geelong*.—Ozone Test Papers. Made by Exhibitor.

67 CLARK AND CO., *Chemical Works, Yarra Bank*.—Chemical Products. Manufactured by Exhibitors.

68 ELLIOTT, E., *Wellington-parade*.—Specimens of the Regulus of Antimony.

69 FLINTOFF AND DEVERIL, *Sturt-st., Ballarat*.—Chemical Products used in Photography. Manufactured by Exhibitors.

70 FRANCIS, HENRY, 31 *Bourke-st. E.*—Pharmaceutical Preparations.

71 GIBBONS, SYDNEY, F.C.S., 6 *Albert-st.*—Chemical Preparations and Products. By Exhibitor.

72 GIBBONS, SYDNEY, F.C.S., 6 *Albert-st.*—Collection of the Elements and their principal Chemical Compounds; New Zealand Petroleum, and Kerosene, &c., prepared from it; various Minerals (Colonial) of commercial value; Petroleum and Associated Rocks from Taranaki, New Zealand.

73 GOSSAGE BROTHERS, *Melbourne and Footscray*.—Colonial-manufactured Crystals of Soda and Silicate of Soda.

74 GRIMWADE, F. S., 125 *Russell-st.*—Specimens of Drugs and Chemicals.

75 HAYES, PATRICK, *Footscray*.—Products of Distillation from Bituminous Shales, Woods, and other Colonial Products, for Burning, Painting, and Machinery.

76 HOOD AND CO., 160 *Elizabeth-st., Melbourne*.—Chemicals and Soft Soap, Sweet Spirits of Nitre, Aromatic Spirits of Ammonia, strongest Liquor of Ammonia, &c. Manufactured by the Exhibitors.

77 JOHNSON, WILLIAM, *St. Kilda*.—One case of Chemicals.

78 KINGSLAND, GEORGE, AND CO., 139 *Lonsdale-st. W.*—Chemical Manufactures.

79 KRUSE, JOHN, *Chemist*, 96 *Russell-st.*—Kruse's Fluid Magnesia, Artificial Mineral Waters, and Chemical Preparations.

80 LEVY BROTHERS, *Bourke-st.*—Case of Drugs.
81 MASTERS, JOHN, *Napier-st., St. Arnaud.*—Bar of Native Copper.
82 PRISTON AND SMALL, 73 *Little Collins-st. E.*—Photographic Chemicals. By Exhibitors.
83 SAYCE, W. B., AND CO.—Case of Chemicals.
84 WELLS, J. J.—Australian Farmers' Friend, for dressing wheat.
85 WILKINSON AND CO., 59 *Dudley-st.*—Moulders' Blacking and Coal Dust.

SECTION 3.—*Miscellaneous.*

86 ABEL, A. T.—Fossil Bones embedded in grey sandstone, with Marine Fossil Shells.

[N.B.—Some additions to this Class will be found enumerated in Dr. Mueller's collection, Class III.]

Class II.—Animal Products.

SECTION 4.—*Wool, Hair, Skins, Furs, Silk, Feathers, Horns, Hoofs, Bones, Guano.*

89 ACCLIMATISATION SOCIETY.—Angora Wool, Cloth made from Angora Wool, Ostrich Eggs, and Stuffed Animals.
90 BINDON AND MILLER, *Temple-court.*—Angora Wool, from Goats the second and third cross between the common and Angora Goat.
91 BLAIR, J., *Portland.*—Three Fleeces of Wool.
92 BOOTH, MRS. JOHN.—Raw Silk, in case.
93 COCKBILL, JOHN, 23 *Little Bourke-st. W.*—Ground Bones, for Fruit Trees, &c.
94 COLLINS, J., AND CO., *Yarra Bank Bone Mills.*—Fertiliser; Bonedust and Bonemeal; Superphosphate of Lime; Manure prepared from Night-soil.
95 COMMISSIONERS OF THE INTERCOLONIAL EXHIBITION, *Melbourne.*—Three Rolls of Spun Wool.
96 CORRIGAN, S. B., *Geelong.*—Bale of Wool. Scoured by Exhibitor.
97 CUNINGHAM AND MACREDIE.—One Stuffed Sheep.
98 CUNINGHAM AND MACREDIE, *Collins-st. W., Melbourne.*—Two Sheepskins.
CUNINGHAM AND MACREDIE (AGENTS), *Collins-st. W., Melbourne.*—
99 ORMOND, F., *Borriyalloch.*—Ewe's Fleece. Bred by Exhibitor.
99*a* CUMMING, JOHN, *Terinallum.*—Ewe's Fleece. Bred by Exhibitor.
99*b* DOWLING, THOS., *Darlington.*—Ewe's Fleece. Bred by Exhibitor.
99*c* SHAW, THOS., *Woorriworite.*—Ewe's Fleece. Bred by Exhibitor.
99*d* CURRIE, JOHN, *Larra.*—Ewe's Fleece. Bred by Exhibitor.
99*e* LEARMONTH, T. AND S., *Ercildoun.*—Ewe's Fleece. Bred by Exhibitor.
99*f* FAIRBAIRN, GEORGE, *Gli Glioah.*—Fleece. Bred by Exhibitor.
99*g* GRIFFITHS AND GREENE, *Glenmore.*—Ewe's Fleece. Bred by Exhibitor.
99*h* SIMPSON, ROBERT, *Langi Kal Kal.*—Ewe's Fleece. Bred by Exhibitor.
99*i* MILLER, S. AND D., *Murrabit.*—Fleece. Bred by Exhibitor.
99*j* RUSSELL, PHILIP, *Carngham.*—Ewe's Fleece. Bred by Exhibitor.
99*k* HOGG, H. S., *Mathoura.*—Fleece. Bred by Exhibitor.
99*l* SCOTT, W. R., *Yalla-y-Poora.*—Sample of Wool—two-year-old Leicester Ram.
100 DOUGLAS, A., AND CO., *Geelong.*—Scoured Wool.
101 FITTS, CHARLES, *Glue Works, Sandridge.*—Samples of "Skutch" Manure, or Glue Refuse; one Bag Phosphate of Lime.
102 FREEMAN, WILLIAM, *Tooborac.*—One Case of Raw Silk.
103 GARDNER, FREDERIC, 84 *Collins-st. W., Melbourne.*—Trophy of Australian Opossum Rugs and Ladies' Furs.
104 GILL, G. D., *Melbourne.*—Samples of Wool.
105 GREEN, JOHN R. H., 33 *Gertrude-st., Fitzroy.*—Colonial-manufactured Furs, Muffs, Victorines, &c.
106 HART, HENRY H., 42 *Collins-st. W.*—Foot Muffs, Slippers, Skating Cap, Rug made of Skins, Native Animals, Lyre Bird, Penguin Table Covers.
107 HONNEUST, A., AND CO., *Maldon.*—Three qualities Glue. Made by Exhibitor.
108 LAYCOCK, WM., AND CO., *Collingwood.*—Two Bags Guano.
109 LINCOLNE, ABRAHAM, 48 *Bourke-st. W.*—Samples of Wool, of Victoria and New South Wales growth.
110 LOADER, THOMAS, AND CO., 195 *Elizabeth-st.*—Curled Hair.

111 LYONS, FRED. J. C., *Hope-st., Geelong.*—Collection of Marine Fossil Bones and Shells, from the Moorabool River, Geelong.
112 MACMEIKAN, JAMES, AND CO., *Flemington Bone Mills.*—A remarkable Shank Bone, from the bone having grown through the ring of the hobble.
113 MACMEIKAN, JAMES, AND CO., *Flemington Bone Mills.*—Artificial Manure, Bonedust, and Superphosphate of Lime; also, Moulders' Blacking, and Coaldust for Foundry purposes.
114 M'KELLAR, DAVID, *Hamilton.*—Fleeces of Merino Wool, Washed and Greasy:
115 MORRIS, ESTHER, 105 *Lygon-st., Carlton.*—Victorine, Muff, and Cuffs from the Down of the Black Swan. Manufactured by Exhibitor.
116 NICHOLSON, B. B., AND CO., 59 *Bourke-st. W.*—Two Bags Malden Island Guano.
117 PIKE, MRS., *Gardiner's-creek road.*—Floss Silk; Cocoons and Hank Silks. Worms fed on Black Mulberries by Producer.
118 PAIN, MRS. H. E., *Melbourne.*—Two cases, containing 120 varieties of Australian Birds' Eggs. Collected in Victoria by Exhibitor.
119 PATENT EARTH CLOSET COMPANY.—One bag of Guano.
120 PIERCE, R. L., *Stawell.*—Two cases containing samples of Fleece Wool.
121 RAMAGE, ALEXANDER, *Stawell.*—One case of Fleece Wool.
122 REED, LOUISA, 108 *Lygon-st., Carlton.*—Samples of Cleaned and Curled Ostrich Feathers; also, Manufactured Fancy Feathers.
123 REEVES, I. G., *East Collingwood.*—Three bales Scoured Wool.
124 ROBERTSON, JOHN, 89 *Lonsdale-st. E., Melbourne.*—Prepared Emu Feathers.
125 ROW, F., AND CO., *Melbourne.*—A Bale of Wool.
126 RUSSELL, THOMAS, AND CO., *Plains, by Inverleigh, Geelong.*—Two Samples of Merino Wool, each Six Fleeces.
127 RUSSELL, THOS., *Rokewood.*—Wool.
128 SECRETARY SHIRE OF ARARAT.—Sample of Leicester Wool. Grown by Mr. Scott, of Yalla-y-Poora.
129 STEPHENS, JOHN PEARSON, *Ballarat.*—Ladies' Muffs, Opossum Skins, and Rug.
130 VICTORIA PATENT MANURE AND CHEMICAL COMPANY (LIMITED), *Lydiard-st., Ballarat.*—Artificial Manures.
131 WILLIAMSON, JOHN, *Carlton.*—Curled Hair. By Exhibitor.
132 WELLS, A. S., *John-st., Fitzroy.*—Cocoon, Web, and Raw Silk.
133 WELLS, MRS. J., *Fitzroy.*—Case of Raw Silk.
134 WOODWARD, GEORGE, *Kew, and* 21 *A'Beckett-street E.*—Victorian Guano: Manufactured from Night-soil Deodorised by the Exhibitor by patent process.

SECTION 5.—*Meat, Fish, Fowl, whether Salted, Dried, Smoked, or Preserved; Gelatine, Isinglass, Milk, Butter, Cheese.*

[The bulk of the articles in this Section are exhibited in the Basement, beyond the Refreshment Rooms.]

135 CROPPA AND BORSA, *Daylesford.*—Twelve Italian Sausages.
136 HOLMUTH, E. R., *Main-st., Ballarat.*—Smoked Beef and Beef Hams; German Sausages. Manufactured by Exhibitor.
137 MUNN, M. A., AND CO., 27 *King-st.*—Hams, Bacon, Lard, and Mess Pork.
138 PENSINS, LEWIS, *Sydney-road, Brunswick.*—Italian Sausages, made in Dunedin, Otago.
139 PETTY, GEORGE, *Bourke-st. E.*—Two Tierces Meat.
140 SMITH, JAMES T., 89 *Queen-st.*—Hams, Bacon, Rolled Bacon, Mutton Hams, Spiced Beef Hams and Pig.
141 SMITH, WILLIAM, 100 *Victoria-st. W., Melbourne.*—Bacon Hogs, cured whole; Rolls and Rolled Bacon, Hams, Middles, Sides, Beef Hams, Roast Beef, Boiled Beef, Roast Mutton, and Boiled Mutton.
142 TAYLOR, THOMAS, 33 *Swanston-st.*—Hams, Bacon, and Tongues.
143 VICKERS, JOSEPH, 14 *Gertrude-st., Fitzroy.*—Cured Legs of Mutton.
144 WATSON AND PATERSON, 11 *Bourke-st. W.*—Bacon, Hams, Preserved Meats and Soups, and tierce of Mess Beef.

SECTION 6.—*Miscellaneous.*

145 DAWSON, MRS.—Collection of Sponges.
146 DE BEER, S., 1 *Queen-st.*—Shells and Coral, from Malden Island.
147 FRASER, M. H., *Daylesford.*—"Abow Hannes," or Sacred Ibis; Native Bird

of the Murray. A name given by the Arabs of Upper Egypt to a Bird which is supposed to be identical with the Sacred Ibis. In ancient times this Bird was regarded by the Egyptians with great veneration, and was embalmed after death. Shot in the district of Glenlyon.

148 GASKELL, JOSEPH, 195 *Bourke-st. E.*—Specimens of Natural History.

149 GILL, EDWIN, *St. Kilda.*—Eggs and Stuffed Animals.

150 HARBOUR MASTER, *Port Albert.*—Nautilus Shell, picked up on Clonmell Island.

151 HOPE, ARTHUR, *Prahran Foundry.*—A Natural Curiosity.

152 NEGUS, R. P., *Murray Fishing Company.*—Collection of Leeches, Gold Fish, &c., of the various colonies of Australia, in an Aquarium.

153 PAIN, MRS. H. E., *Melbourne.*—Two cases of Coral—very rare specimens from the Australian Seas.

154 PAIN, H. E., *Melbourne.*—Twenty-four cases of Insects, collected in the various Colonies of Australia by the Exhibitor. Ten cases of Crustaceæ, collected in the various colonies of Australia, including some from the South Pacific. Five cases of Land or Snail Shells, principally collected in the various Colonies of Australia. Fifteen cases of Marine Shells, collected principally on the Australian Shores. One case containing a large and beautiful piece of Coral, fished at Bird Island, in the Australian Seas.

154*a* REID, THOMAS, *Blackwood-st., Hotham.*—Reef Coral, in Case.

155 ST. JOHN, J., 13 *Raglan-st., Ballarat.*—A Case of Native Birds.

156 THOMSON, WM. JAMES, 3 *Little Collins-st. W.*—Flying Squirrels (Belidedus Flaviventus).

157 WILLIAMS, JOHN, *Bay-st., Brighton.*—Case of Butterflies, Moths, and Locusts.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

SECTION 7.—*Cereals, Agricultural and Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

158 ADAMS, BENJAMIN.—English Teazles. Grown by Exhibitor.

158*a* ALLAN, MRS. A. C., *Warrnambool.*—Specimen of Native Bread, called by the Aborigines "Bouyatt," from Cape Otway Ranges. Supposed to be the finest specimen ever found in Victoria.

159 ASHLEY, EDMUND, *Victoria-st.*—Colonial-grown Maize, in cob.

160 BAKER, T., *Nunawading.*—Tanning Barks of Melaleuca Ericifolia, of Eucalyptus Obliqua, of Eucalyptus Amygdalina, and other kinds of Trees.

161 BANKS, THOMAS, *Domain-road, South Yarra.*—Dried Specimens of Plants; Water-colour Drawings of Fruits and Flowers.

162 BATES, CHARLES.—Colonial-manufactured Cocoa.

163 BENCRAFT, GEORGE.—Sample of Flour.

164 BENJAMIN, B., 217 *Bourke-st. E., Melbourne.*—Colonial-manufactured Cigars, made from Havannah leaf. Manufactured by Exhibitor.

165 BEVERIDGE, PETER, *Swan Hill, Murray River.*—Eight kinds of Timber:—Buf Lue (Chinkeis of the Aborigines)—this tree produces water from the roots; Pooth Pooth of the Aborigines; Murray Pine (Morom of the Aborigines); Causmina (Nynny of the Aborigines)—it is commonly called Nener Oak by the whites; Mally (Booronyeis of the Aborigines)—this wood is much used by the natives for spears, and other weapons both of war and chase; Box (Bulloit of the Aborigines)—this wood is singularly hard, and well fitted for shipbuilding or wheelwrights' purposes; Causmina (Marn of the Aborigines), named by the whites Mally Oak—it is a fine timber for coachbuilding purposes, or dray shafts; Mally (Weir of the Aborigines)—this is the tree from the roots of which the blacks get supplies of water when travelling through the scrub on their manifold ramblings during summer; Timber of Hakea Stricta, Myoporum Platycarpum, Callibris Verrucosa, Casuarina Cristata, Eucalyptus Oleosa, Eucalyptus

Gracilis, Eucalyptus Largi florens; Gum of Acacia homalophylla; Resin of Callitris Verrucosa; Textile Reed of Cyperus Vaginatus, and fibre prepared therefrom; Fibre of Typha Shuttleworthii.

166 BOARD OF AGRICULTURE.—Forty Bottles of Soils, Reports on same, and Eighteen Samples of Cereals.

167 BOARD OF AGRICULTURE (PER).—Buchanan, Robert, sample Wheat; Wilson, William, sample Wheat; Brisbane, James, sample Wheat; M'Andrew, Donald, sample Barley; Wright, Thomas, sample Barley; Warrenheip Distillery Company, sample Barley; Gough and Co., sample Barley; Lien, William, sample Oats; Brunton and Gillespie, sample Oats; Fisker, A., sample Oats; Bailey, William, sample Oats; Gough and Co., sample Barley; Cole, B. N., sample Peas; Law, Somner and Co., sample Peas; Wright, Thomas, sample Peas; Costello, F., sample Flour; Holmes, White and Co., sample Flour; Brunton and Gillespie, sample Peas.

168 BRACHER AND PARSONS, 68 *Elizabeth-st., Melbourne.*—Case containing Specimens of Coffee and Spices. Prepared by Exhibitors.

169 CANDY, WILLIAM, 204 *Bourke-st. E.*—Medicinal Herbs, Roots, and Barks.

170 CAPP, R. F., *Chilwell, Geelong.*—Arrowroot. Grown by Exhibitor.

171 COFFEE, JEREMIAH, *Spring-hill, Creswick.*—Red Tuscan Wheat.

172 COLE, B. N., *Mooneep Station.*—White and Grey Peas By the Producer.

173 COSTIN, HENRY, *Ballarat.*—Collection of Timber.

174 COULSTON, ELIJAH, *Ondit Vineyard, Colac.*—Spring Wheat.

175 CRAIG, JOHN, *Moolap, Geelong.*—Flax in the Sheaf, with the Seed; samples of Flax Seed.

176 COMMISSIONERS OF INTERCOLONIAL EXHIBITION.—Planks, Transverse Sections, and other specimens of Timber, illustrating 62 species of wood, list annexed; Gum Resins of Eucalypti from Colac and East Gippsland; Gum of Brachychiton Populneum; collection of Barks for tanning purposes, from East Gippsland; Bark of (1) Callitris Cupressiformis, (2) Acacia Pennivervis, (3) Eucalyptus longifolia, (4) Brachychiton Populneum, (5) Eucalyptus corymbosa, (6) Angophora instermedia, (7) Eugenia Smithii, (8) Banksia serrata, (9) Pittosporum undulatum, (10) Sponia aspera, (11) Vitis hypoglauca, and several other trees; Textile Bark of Pimelea axiflora; Paper-knives of 25 kinds of wood; collection of Fruits and Vegetables.

TIMBER.

Acacia Melanoxylon—Brown; Acacia Mollissima—Willdenow; Acacia Penninervis—Silber; Subporosa—Ferdinand Mueller; Acacia Verticillata—Willdenow; Acacia Implexa—Bentham; Acacia Salicina—Lindley; Acacia Oswaldii—Ferdinand Mueller; Acacia Stenophylla—A. Cunningham; Acacia Homalophylla—A. Cunningham; Angophora Intermedia—Candolle; Aster Argophyllus—La Billardière; Atherosperma Moschatum—La Billardière; Avicennia Officinalis—Linné; Banksia Serrata—Linné; Banksia Australis—Brown; Banksia Integrifolia—Linné; Brachychiton Populneum—Brown; Callitris Cupressiformis—Ventenat; Callitris Verrucosa—Brown; Cassinia Aculeata—Brown; Casuarina Quadrivalvis—Ventenat; Casuarina Leptoclada—Miguel; Coprosma Microphylla—A. Cunningham; Codonocarpus Cotinifolius—Ferdinand Mueller; Casuarina Cristata—Miguel; Eucalyptus Corymbosa—Smith; Eucalyptus Fissilis—Ferdinand Mueller; Eucalytpus Stuartiana—Ferdinand Mueller; Eucalyptus Longifolia—Link; Eucalyptus Goniocalyx—Ferdinand Mueller; Eucalyptus Melliodora—A. Cunningham; Eucalyptus Amygdalina—La Billardière; Eucalyptus Rostrata—Schlechtendal; Eucalyptus Pilularis—Smith; Eucalyptus Viminalis—La Billardière; Eucalyptus Obliqua—L'Héritier; Eucalyptus Oleosa—Ferdinand Mueller; Eucalyptus Albens—Miguel; Eucalyptus Globulus—La Billardière; Eucalyptus Leucoxylon—Ferdinand Mueller; Eugenia Smithii—Poiret; Exocarpus Cupressiformis—La Billardière; Eupomatia Laurina—Brown; Fagus Cunninghamii—Hooker; Hedycarya Cunninghamii—Tulasne; Hakea Stricta—Ferdinand Mueller; Lomatia Frascerii—Brown; Leptospermum Laevigatum—Ferdinand Mueller; Myrsine Variabilis—Brown; Melalenca Ericifolia—Smith; Melalenca Squarrosa—Smith; Myoporum Platycarpum—Brown; Panax Palmaceus—Ferdinand Mueller; Pittosporum Undulatum—Ventenat; Pittosporum Bicolor—Hooker; Pomaderris Apetala—La Billardière;

Santalum Persicarium—Ferdinand Mueller; Santalum Acuminatum—Candolle; Senecio Bedfordii—Ferdinand Mueller; Tristania Laurina—Brown; Vitis Hypoglauca—Ferdinand Mueller.

177 HALL, WILLIAM, *River Farm, Williamstown.*—Maize in cob, French Beans in pod. Produced and grown by Exhibitor.

178 HANCOCK, B. P., *Warrions, Colac, Grenville.*—One bushel Wheat grown off volcanic soil, harvest 1866, produce 30 bushels per acre; one bushel Chevalier Barley.

179 HARPER, ROBERT, AND CO., 57 *Flinders-lane E.*—An assortment of Coffees, Spices, &c. Manufactured by Exhibitors.

180 HARRIS, JOSEPH, *South Yarra Nurseries.*—Coniferous and other Plants.

181 HODGSON, JOHN, *Dunolly.*—Tobacco and Cigars. Produced and manufactured by Exhibitor.

182 HOMMEL, T., AND CO., 127 *Lonsdale-st. W.*—Manufactured Tobacco and Snuff.

183 HUGHAN, ALLAN, *Yongera.*—Timber of Myoporum Platycarpum, Codonocarpus Cotinifolius, Santalum Persicarium, Acacia oloesa, Santalum Acuminatum, Acacia Oswaldii, Acacia Stenophylla, Callitris Verrucosa.

184 KIDD, JAMES A., *Portarlington.*—Colonial-grown Flax and Cotton (Dressed).

185 KILMORE AGRICULTURAL SOCIETY.—Wheat, Barley, Oats.

186 LAVERS, ROBERT, *opposite Public Library.*—Currie Powder.

187 LINCOLNE, ABRAHAM.—Wheat and Oats.

188 M'ANDREW, MR., *Bellarine, Geelong.*—Samples of Wheat and Barley.

189 M'KENZIE, JAMES, AND CO., 3 *Queen-st.*—Coffee, Spices, and Chicory; Oatmeal and Pearl Barley. Manufactured by Exhibitors.

190 M'KINNON, DONALD, *Miller-st., Daylesford.*—Plank of Stringy Bark, grown in Bullarook Forest, near Daylesford.

191 MOSS, WHITE AND CO., 124 *Queen-st., Melbourne.*—Colonial-manufactured Cigars, from Havannah Leaf. Manufactured from imported tobacco by Exhibitors.

192 MUELLER, DR. FERDINAND, *Curator of Botanical Gardens, Melbourne.*—
Medicinal Bark of Victorian Sassafras (Atherosperma Moschatum).
Four Fern Trees in a growing state (Dicksonia Antarctica).
Samples of Raw Material for the Manufacture of Paper.
Samples of Paper from Indigenous Vegetable Substances.
Liquorice Roots.
Hops.
Edible Seeds of Italian Pine (Pinus Pinea).
Sample of Chinese Tea.
Potash of Dicksonia Antarctica, of Eucalypti, of Callitris Varrucosa, of Casuarina cristata, and other Woods.
Wood Spirits of Casuarina quadrivalvis, Acacia Melanoxylon, Banksia Australis, Melaleuca Ericifolia, Acacia Mollissima, Eucalyptus Leucoxylon, Eucalyptus Rostrata, Eucalyptus Globulus, Eucalyptus Obliqua, Angaphora Intermedia.
Wood Vinegar, prepared from the ten kinds of wood above mentioned.
Tar, prepared from the ten kinds of wood above mentioned.
Charcoal, of the ten kinds of wood above mentioned.
Acetate of Lime, prepared from the Wood Vinegar of Eucalyptus Globulus.
Acetate of Soda, prepared from the Wood Vinegar of Eucalyptus Globulus.
Acetate of Protoxyde of Iron, prepared from the Wood Vinegar of Eucalyptus Globulus.
Acetate of Peroxyde of Iron, prepared from the Wood Vinegar of Eucalyptus Globulus.
Sesquiacetate of Alumina, prepared from the Wood Vinegar of Eucalyptus Globulus.
Varnish, prepared from Resin of Xanthorrhœa Australis and Wood Spirit of Eucalyptus Globulus.
Wood Vinegar Tar, and Residue therefrom.
Wood Specimens coaled with Wood Tar.
Wood Specimeus dyed with Acetate of Iron.
Collection of Cereal Grains, and other Economical or Medicinal Seeds.
Collection of Medicinal Herbs.

Snuff prepared from Cotula Minuta.
Extract of Eucalyptus Leaves.
Collection of Varnishes.
Oil of Eucalyptus Stuartiana.
Ink, made of Native Substances.
Articles tanned with various kinds of Native Bark.
Picric Acid, from Xanthorrhœa Resin.
A Calico-covered Case for the Distant Transit of Living Plants.
Dye Materials.
Wood of Elæocarpus Holopetalus.
Wood of Acacia Lophantha, grown in Victoria.

[The Chemical Products enumerated in this list properly belong to Class I., but are arranged in Class III. for convenience of reference and examination.]

193 OGIER, J. C. H., *Ballarat.*—Native Bread, from Gordon's, near Ballarat.
194 ORLEBAR, JOHN, *Tooram, Warrnambool.*—Wheat, Oats, Mangolds, Cheese.
195 OWEN, DUDGEON AND ARNELL, 159 *Elizabeth-st.*—Manufactured Tobaccos and Snuffs.
196 PAIN, MRS. H. E., *Melbourne.*—Fifty Frames of Australian Ferns; 80 Frames of Algæ, or Seaweeds. Collected and preserved by Exhibitor.
197 POLITZ AND CO., *Bourke-st.*—Manufactured Tobacco, of pure Colonial Leaf.
198 POLITZ AND WARMER.—Colonial Leaf Tobacco. Grown near Dandenong.
199 RAILTON, DAVID B., 108 *Swanston-st.*—Rye-grass Seed; Perennial Rye-grass; 26 cobs early-seed Maize. Grown by Robert Buchanan, Berwick.
200 RAYNBIRD, GEORGE, 215 *Elizabeth-st.*—Agricultural and Garden Seeds; a new kind of Prairie Grass; large French Lentils; Spelt Wheat; Naked Barley, weight above sixty pounds per bushel; Naked Oats for Fodder; Large and Small Haricôt Beans.
208 SMYTH, R. BROUGH.—Sample Potatoes.
202 ROBINSON, G. AND E., *Hillsby.*—Specimens of Timber.
203 ROBINSON, W. GEORGE, *Berwick.*—Block of Victorian Beech Timber, and Slabs of the same, from near Mount Baw Baw, Gippsland.
204 SCOTT, JAMES, *Nursery, Hawthorn.*—Flowers and Plants.
205 SEPPELT, J. W., *Belvoir.*—Leaf Tobacco, colonial-grown; and Cigars made from same.
206 SHAW, CHARLES, 113 *Stephen-st.*—Thread of the Agave, or American Aloe.
209 SOLOMON AND CO., 1 *Queen-st.*—Hops, season 1866.
210 SPADONI, GIUSEPPI, *Melbourne.*—Italian Hemp. Manufactured in Bologna.
212 TAYLOR AND SANGSTER, *Nursery, Toorak.*—Collection of Coniferous Plants.
213 TOBELMAN, W. G., *Melbourne.*—Cigars.
214 TURNER, WILLIAM, *Lilydale, Evelyn.*—Black, Dog, and Musk Wood; Axe and Adze Handles.
215 VIEUSSEUX, D., AND CO., *Emerald Hill.*—Cocoa and Chocolate. By the Exhibitors.
216 VETTERS, MR., *Echuca.*—Cotton.
217 WEBER BROTHERS, *Leigh-road.*—White Wheat. Grown by Exhibitors.
218 WEMBRIDGE AND FEROEICH, *Inglewood-road, St. Arnaud.*—Giant Rye. Produced by Exhibitors.

SECTION 8.—*Flour and Meal, of every Variety and in every Form; Malt, Starch, Gluten, Sago, Tapioca, Arrowroot, Sugar, Confectionery.*

220 ÆRATED BREAD COMPANY, 203 *Bourke-st. W.*—Samples of Ærated Bread.
222 BENCRAFT, GEORGE, *Flinders-lane W., Melbourne.*—Colonial Flour, Oatmeal, Maize Meal, Pearl Barley, and Prepared Groats.
223 BROWN, JOHN, *Dunolly.*—Confectionery. Manufactured by Exhibitor.
224 DANIELLI, SEBASTIAN, *Sydney-road, Brunswick.*—Macaroni, Vermicelli, &c. Manufactured by Exhibitor.
225 DILLON AND BURROWS, *Latrobe-st. W., Melbourne.*—Colonial-manufactured Confectionery.
226 EDWARDS, JAMES, *Napier-st., St. Arnaud.*—Six Cases of Fancy Biscuits. Manufactured by Exhibitor.
228 GIRAUD AND CO., 91 *Bourke-st. E., Melbourne.*—Preserved and Crystallised Fruits, Chocolate and Homœopathic Cocoa, French and English Confectionery.

229 GOUGH, J., AND CO., 123 *Flinders-st. E.*—Malt made from Colonial-grown and Imported Barley; Patent or Black Malt. Manufactured by Exhibitors.
230 GREENSLADE, JOSEPH, 207 *Elizabeth-st.*—Confectionery.
231 IRONS, MR., *Echuca.*—Specimen of Native Arrowroot.
232 MUNN, MATTHEW A., AND CO., 27 *King-st.*—Maizena and Starch.
232*a* SMITH AND SON, 71 *and* 73 *Gore-st.*, *Fitzroy.*—Machine and Fancy Biscuits.
233 STRUTH, MR., *Warrnambool.*—Sack of Flour from Wheat Grown in the District.
234 SWALLOW AND ARIELL, *Sandridge.*—Ship and Fancy Biscuits. Exhibited by the Manufacturers.
234*a* STICKLAND, JAMES, 50 *Gertrude-st.*, *Fitzroy.*—Fancy Biscuits, in case.
235 SYMINGTON, WILLIAM, *Bacchus Marsh.*—Granulated or Preserved Potatoes. Manufactured by Exhibitor.
236 TAYLOR, JOHN, *Dana-st.*, *Ballarat.*—Biscuits and Confectionery.
237 THOMPSON AND CO., *Kennedy-st.*, *Castlemaine.*—Flour, Maize, and Meal. Manufactured by Exhibitors.
238 URIE, YOUNG AND CO., *Richmond.*—Patent Refined Maizena; Starch, White and Blue; Australian Washing Powders; Wilson's Baking Powders; Maize; Bran; and Pollard.
238*a* WILSON, S., *Wimmera.*—Arrowroot. Grown and manufactured by Exhibitor.

SECTION 9.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

239 AITKEN, THOMAS, *Victoria-parade Brewery, East Melbourne.*—Colonial Ale; Porter, in wood and bottle; Whisky; and Spirits of Wine.
242 BILLING, NATH., *Waltham-terrace, Richmond.*—Colonial Wine. Grown by Exhibitor.
243 BOARDMAN, PIERCE, *Box-hill, Nunawading.*—Lavand. Victoria (Oil of Lavender), distilled 1865; Lavand. Victoria (Oil of Lavender), distilled 1866; Melaleuca Ericifolia (Common Tea-tree), 1865; Melaleuca Ericifolia (Common Tea-tree), 1866; Menth. Pip. (English Peppermint), grown in Victoria, distilled 1864; Menth. Pip. (English Peppermint), grown in Victoria, distilled 1865; Angophora Intermedia (Apple-tree); Ol. Carui (Oil of Carraway); Ol. Macidis (Oil of Mace); Ol. Origani (Oil of Thyme); Ol. Caryophilla (Oil of Cloves); Ol. Caryophilla (Oil of Cloves); Eucalyptus Dealbata (Grey Box); Eucalyptus Leucoxylon (Box); Eucalyptus Acmenoides (Broad-leafed Box); Eucalyptus Fabrorum (Stringy Bark); Eucalyptus Goniocalyx (White Gum); Eucalyptus Globulus (Blue Gum); Eucalyptus Corymbosa (Blood Wood), obtained by destructive distillation; Eucalyptus Fissilis (Mesmate); Eucalyptus Amygdalina (Peppermint); Atherospermum Moschatum (Sassafras), Lavender Water; Lavender and Wattle; Violets; Violets and Mignionette.
244 BOSISTO AND CO., *Bridge-road, Richmond.*—Distillations from Native Vegetation, Resins, Gums, and Barks.
245 BREHENY, JOHN, *Williamstown.*—Bottled Ale.
246 BRYCE, JAMES, 240 *Victoria-parade, East Melbourne.*—Colonial Jams and Bottled Fruits.
247 CALDWELL, ROBERT, 33 *Queen-st.*—Colonial Wine. Grown at Dromana Vineyard.
248 CARLTON BREWERY COMPANY, *Bouverie-st.*, *Melbourne.*—Two Hogsheads Ale.
249 CLARK, S. A., AND CO., 111 *and* 113 *William-st.*, *Melbourne.*—Worcestershire Sauce. Manufactured by Exhibitor.
250 CLARKE, WALTER, *Glenara, Bulla.*—Colonial Wines, vintage 1864-5.
251 CLARSON, C., 3 *Evans-place.*—Preserves and Sauces. By Exhibitor.
252 COHN BROTHERS, *Talbot.*—Colonial Ale.
253 COHU, ANDREW, 24 *and* 26 *Little Collins-st.*—Ginger Wine, Brandy, Raspberry Vinegar, and other Cordials. Manufactured by Exhibitor.
254 COLLER, MRS.—Elderberry Wine.
255 COMMISSIONERS OF INTERCOLONIAL EXHIBITION.—Models of Australian Fruits. The grapes were presented by Mr. Moore, Collins-street west.
256 COPLEY, EDWARD, AND CO.—Sample Bottled Stout.
257 CRIPPA, FABRIZZIO, *Hepburn.*—Colonial Wine (Burgundy).

258 DICKENSON, JAMES HENRY, *Standard Brewery Company, Castlemaine.*—Ale and Porter, in hogsheads; and Bottled Ale and Porter.
259 DICKSON, JAMES, 9 *Latrobe-st. E.*—Wines, Cordials, Vinegar, and Blacking.
260 DIXON, PHILLIP G., 32 *Rosslyn-st., West Melbourne.*—Cordials, Liqueurs, Ærated Waters, &c.
261 ELLIOTT, S., *Brighton.*—Colonial White and Red Wine. Exhibited by the Grower.
262 EVERIST, T. J., *Spring-hill, Upper Hawthorn.*—Varieties of Colonial Wine. Grown by Exhibitor.
262*a* EWING, T. A., *Fitzroy-st.*—Yeast Powder and Flavouring Essences.
263 FALLON, JAMES, *Albury.*—Five Samples of Wine.
264 FARRINGTON, C. M., AND CO., *Ballarat Brewery.*—Ale and Porter, in wood and bottle.
265 FELTON, ALFRED, 41 *Swanston-st.*—Wines, Liqueurs, and Cordials; Oilmen's Stores; Laundry Blues.
266 FITZGERALD AND CO., *Newbridge Brewery.*—Bottled Porter. By the Exhibitors.
267 FITZGERALD AND PERRINS, *Wombat Brewery, Daylesford.*—Bottled Stout.
268 FITZGERALD, N., *Castlemaine Brewery.*—Ale, in Wood. By Exhibitor.
269 FLINTOFF, THOMAS, AND CO., 97 *Webb-st., Fitzroy.*—Cordials.
270 FORDHAM, F., 1 *William-st., Melbourne.*—Pickles, Sauces, Salt Fish, Sardines, Jams, &c. Colonial manufacture.
271 FORSTER, W. M., 31 *Post-office place.*—Old Tom Gin. Compounded and manufactured by the Exhibitor.
272 FRANCIS, H., 31 *Bourke-st. E.*—Perfumery.
273 GUPPY, WALTER, *Moor-park, Benalla.*—Colonial Wine. Grown by Exhibitor.
274 GUSEITTI, DR., *Newbridge.*—Colonial Wines.
275 HEMMONS, F. AND J., 70 *Little Collins-st. E.*—Spirits, Cordials, and Liqueurs. Manufactured by Exhibitors.
276 HEYNEMAN, G. C., *Melbourne.*—Samples of Vinegar. Manufactured by Exhibitor.
277 HOPE, R. C., *Batesford.*—Colonial Wines.
278 HOPWOOD, E., *Echuca.*—Colonial White and Red Wines.
279 KIDSON, JAMES, AND CO., *Derby-st., Collingwood.*—Bottled Ale and Porter,
280 KINGSLAND, G., AND CO., 139 *Lonsdale-st. W.*—Ærated Waters, Cordials, and Perfumery.
281 KIRKBRIGHT, W., *Collingwood.*—Fruit and Marmalade.
282 KNIGHT, G. W., *Rosenberg Vineyard, Riddell's Creek.*—Colonial Wines, Preserved Fruits and Jams.
283 KOFORD, JOHN.—Sample Bottled Stout.
284 LEVY BROTHERS, 24 *Bourke-st.*—Case of Perfumery.
285 MAPLESTONE, CHARLES, *Ivanhoe Lodge, Heidelberg.*—Colonial Wines and Preserved Fruits.
286 MARTIN, P. J., *Australian Brewery.*—Ale, Porter, and Vinegar. Manufactured by Exhibitor.
287 M'CRACKEN, R., 110 *Little Collins-st. W.*—Two Hogsheads Colonial Ale. Manufactured by Exhibitors.
288 MELLON, F., *Dunolly.*—Dried Fruits and Dunolly Claret.
289 MEREDITH, THOMAS, *Chewton.*—Colonial Wine. Grown by Exhibitor.
290 MILLER, W.—Two samples Colonial Wine.
291 MITCHELL, MRS. GEORGE, *Dorrit-st., Carlton.*—Brandy and Pickled Fruits, Sauces, and Hair Tonic.
292 MOODY, FREDERICK A., AND CO., *Temple-court, Collins-st.*—Upper Murray Wines, white and red.
293 MOODY, LESLEY A., *Chief Inspector of Distilleries.*—Wines:—1—Mixed Red, from Marangan (William Piper), 20 per cent. of spirits at proof by Sykes's hydrometer, 53 o.p. 2—Mixed Red, from Marangan (William Piper), 20 per cent. of spirits, 42 o.p. 3—Mixed Red, from Marangan (William Piper), 20 per cent. of spirits, 10 u.p. 4—St. Peter's, from Huntly (Mr. Panton), 25 per cent. of spirits, 40 o.p. 5—St. Peter's, from Huntly (Mr. Panton), 25 per cent. of spirits, 40 o.p. 6—St. Peter's, from Huntly (Mr. Panton), 25 per cent. of spirits, 20 u.p. 7—St. Peter's, from Huntly (Mr. Panton), 25 per cent. of spirits, 15 u.p. 8—St. Peter's, from Huntly (Mr. Panton), 25 per cent. of spirits, 10 u.p. 9—Carignan, from Ceres (Louis Kitz), 20 per cent. of spirits, 54 o.p.

10—Carignan, from Ceres (Louis Kitz), 20 per cent. of spirits, 54 o.p. 11—Carignan, from Ceres (Louis Kitz), 20 per cent. of spirits, proof. 12—Carignan, from Ceres (Louis Kitz), 20 per cent. of spirits, 10 u.p. 13—Carignan, from Ceres (Louis Kitz), 20 per cent. of spirits, 10 u.p. 14—St. Peter's, from Huntly (Mr. Panton), 25 per cent. of spirits, 10 u.p. 15—Chasselas, from Batesford (J. H. Dardel), 20 per cent. of spirits, 7 o.p. 16—Chasselas, from Batesford (J. H. Dardel), 20 per cent. of spirits, 10 u.p. 17—Chasselas, from St. James's (Weber Brothers), 24 per cent. of spirits, 27 o.p. 18—Chasselas, from St. James's (Weber Brothers), 24 per cent. of spirits, 10 u.p. 19—Chasselas, from St. James's (Weber Brothers), 24 per cent. of spirits, 17 u.p. 20—Chasselas, from St. James's (Weber Brothers), 24 per cent. of spirits, 17 u.p. 21—Mixed, from various vineyards, 21 per cent. of spirits, proof. 22—Mixed, from various vineyards, 21 per cent. of spirits, 10 u.p.

294 PEARSON, GEORGE, *Condell's-lane.*—Bottled Ale, Porter, Ginger Wine, Raspberry Vinegar, Ginger Brandy. Exhibited by the Manufacturer.

295 PIN, J. B., *Melbourne.*—Colonial Wines.

296 PIPER, WILLIAM, *Benalla.*—Benalla Wine—Marigan, 1865; Scyras; White Marangan.

297 POTTS AND CO., 51 *Little Bourke-st. W.*—Hollands Gin, Old Tom, Ginger Brandy, and Ginger Wine.

298 POWELL, THOMAS, *Geelong.*—Hogsheads of Ale. Brewed by Exhibitor.

299 PREVOT, E. J., AND CO., 120 *Queen-st.*—Wines, Cordials, Ærated Waters.

300 ROSS AND CO., 111 *Bourke-st. E.*—Colonial Wines, produced at Yering.

301 ROSSI, THOMAS.—Vegetable Sauce.

302 ROWLANDS AND LEWIS, *Sturt-st., Ballarat.*—A Stand of Soda Water.

302*a* RICHMOND, J., *Moss-st., Prahran.*—Scents and Essences; Hairwash; Pomade; Hair Oil. Manufactured by Exhibitor.

303 SCHROEDER, E., *Vineyard, Castlemaine.*—Colonial Wine, and Red Imperial Burgundy. Grown by Exhibitor.

304 SHAW, MRS., *Carlton.*—Quince Jam, from Fruit grown by Sir Redmond Barry and Sugar manufactured at Sandridge.

305 SLATER, W. H., *Box-hill, Nunawading.*—Essential and Prepared Oils, Perfumery.

306 STANDARD BREWERY COMPANY, *Castlemaine.*—Ale and Porter, in Wood and Bottle.

307 TAEGTOW, F., *Williamstown.*—Bottled Ale. Brewed by Exhibitor.

308 TRONETTI, JEAN PIERRE.—Colonial Wine.

309 UMPHELBY, C. W., AND CO., 60 *Collins-st. W.*—Colonial Wines, Vintage 1864, grown at Benalla—Red Muscatel, White Marragan, White Muscat, Malbec, Chasselas, Red Marragan, and Scyras.

310 VAUGHAN AND WILD, *Smith-st., Collingwood.*—Two hogsheads Ale, two cases Porter.

311 VICTORIA SUGAR COMPANY, *Sandridge.*—Samples of Refined Sugar, Rum, Treacle, and Animal Charcoal.

312 WARRENHEIP DISTILLERY COMPANY, *Warrenheip.*—Malt Whisky, Geneva.

313 WATT, ARCHIBALD, 129 *Queensberry-st., Hotham.*—Jams, Marmalades, Pickles, Sauces, &c. Manufactured by Exhibitor.

314 WATTS, HENRY, *Warrnambool.*—Case of Perfumes, distilled from Flowers grown in Warrnambool.

315 WHITE BROTHERS AND CO., *Melbourne.*—Victorian Wine—One dozen Reisling, grown near Sandhurst.

316 WOOD AND WARE, *Brewery, Collingwood.*—Ale and Porter, in Wood and Bottle. By Exhibitors.

317 ZORN, EDWARD, *Oakleigh.*—Colonial Pickles, Sauces, Preserves, &c.

SECTION 10.—*Miscellaneous.*

318 ARGNANI, AUGUSTE, *Dunolly.*—Oleaginous Blacking; Concentrated Essence of Tomatoes; Black Ink. Manufactured by Exhibitor.

318*a* BRAZENDALE AND CO., *High-st., Prahran.*—Writing and Shoe Ink. Manufactured by Exhibitor.

319 BOLAND, MISS, 3 *Victoria-parade, Fitzroy.*—Case of Seaweed from Queenscliff.

319*a* DINE, HARRY.—Book of Flora.
320 ELLIS, PETER, *Daylesford.*—Japan Blacking (colonial manufactured).
320*a* FRANCIS, H., 31 *Bourke-st. E.*—Marking Ink.
321 HORNE, R. H., *Trentham, Blue Mountain.*—Boughs Plaited or Twisted by Insects or Reptiles.
321*a* MALLETT, JAMES, *Albert-st., Windsor, Prahran.*—Colonial-manufactured Ink and Blacking.
322 MILLER, J. G., 39 *Little Collins-st. W.*—A Compound for Destroying Mosquitoes; a Compound for Neutralising Putrid Air. Invented by Exhibitor.
322*a* NEIGHBOUR, H. T., *Stanley-st., West Melbourne.*—New Hair Restorative. Manufactured by Exhibitor.
323 TINSON, J., *Ararat.*—A Piece of Wood found 152 feet under ground, and below the bluestone formation.
324 WATTS, H., *Warrnambool.*—Book of Seaweeds.
325 WORMALD, F. G., 21 *and* 23 *Madeline-st.*—Ink Powders and Ink.

Class IV.—Manufactures and the Useful Arts.

SECTION 11.—*Porcelain and Pottery, Glass, Iron and Hardware, Cutlery, Wickerwork.*

326 AMOS, ROBERT, 139 *Collins-st. W.*—Sections of Rolled and Hammered Iron, showing the process of manufacture.
327 APPLETON, ROBERT, 203 *Bourke-st. E.*—Illuminated Glass and Perfumery.
328 BANNISTER, R. D.—Horned Purchase Hook.
329 BEAUMONT, SAMUEL, 226 *Bourke-st. E.*—Wire Bird Cage. Manufactured by Exhibitor.
331 BROWN, WALTER, 67 *Chancery-lane.*—Tailor's Self-heating Iron. Invented by Exhibitor.
332 CHESTERFIELD POTTERY COMPANY, 123 *Lonsdale-st. W.*—Brown Pottery—Jars, Pans, and Bottles, for domestic use.
333 CORNWELL, ALFRED, *Brunswick Potteries.*—Assorted Stone Ware. Exhibited by Manufacturer.
334 DELLITT, W., 18 *Flemington-road.*—Wickerwork Chairs, &c.
335 DEMPSTER, ANDREW, 89 *Russell-st.*—One Eight-light Patent Octagon Reflector, adapted for the lighting of public buildings, as used in the Great Hall of the Exhibition. One Four-light Patent Long Reflector, adapted for the lighting of shop windows. Manufactured and exhibited by the Patentee.
336 DIERMIESSEN, C., 5 *Albert-st.*—Lady's Window Companion; Polishing Powder.
337 DUNN, THOMAS A., *Buckingham-st., Richmond.*—Scagliola Chimneypieces and Pedestals.
338 EARNSHAW, S., *Sandridge Foundry.*—Cooking Range and Ovens. Manufactured by Exhibitor.
340 GARBUTT, JOSEPH, *Barkly-st., Carlton.*—Five pairs Hames, various.
341 GRAYSON, JOHN, 62 *Smith-st., Collingwood.*—Cutlery and Tools. Manufactured by Exhibitor.
342 HIRSCHI, G., *Barker's-creek, Castlemaine.*—Water Cooler, Electric Battery Cells, Telegraph Non-conductors, Gold-refining Cup and Lid. Made by Exhibitor.
343 HOME, J. W., *A'Beckett-st.*—Various Garden Chairs of cast iron.
344 HUGHES AND HARVEY, 144 *and* 146 *Lonsdale-st. E., Melbourne.*—Samples of Wrought Iron Ovens, Iron Well Buckets for Stations, Sheep Troughing, Brass and Coppered Beer or Wine Warmers, Japanned Grocers' Canisters, Show Bowls, Toilet Sets, Baths, Milk Cans, &c. Manufactured by Exhibitors.
345 HUTCHISON, WILLIAM, 16 *Little Bourke-st. E.*—Patent Colonial Cast-iron Ovens; Registered Grate; and several Ornamental Castings. Manufactured by Exhibitor.
346 KELLY, THOMAS, *Brunswick.*—Stoneware Drain Pipes.
347 MATHIESON, JAMES, 82 *Bourke-st. W.*—Masons' and Mining Tools.
347*a* MARK, G. BARRETT.—Samples of Pottery.

348 NELSON, THOMAS, 118 *High-st.*, *St. Kilda.*—Enclosed Kitchen. Manufactured by Exhibitor.
349 PARROTT, FREDERICK, *Geelong.*—Two Ecliptical Springs for Carriages.
350 REED, JAMES.—Machine for Drawing Corks.
351 STACEY AND BRYANT, *Latrobe-st.*—Galvanised Iron Guttering, Ridging, &c. Manufactured by Exhibitors.
352 STEILING, G. P., *Bridge-road*, *Richmond.*—Pottery and Building Materials.
353 SULLIVAN, JEREMIAH.—Irish Spade. Manufactured by Exhibitor.
354 WALLIS, F., *Otter-st.*, *Collingwood.*—Two Colonial Ovens; One Range; One Cooking Apparatus.
355 WIEGMANN, AUGUSTE, 33 *Post-office place.*—Basket Work, Chairs, Flower Stand, Cradle. Made of Willow by Exhibitor.
356 WILSON, R. J., *Flemington.*—New Mode of Shoeing Horses.
357 WIPER, JOHN, 66 *Collins-st. E.*—Bent and Cut Glass, of different designs.

SECTION 12.—*Leather and its Applications, Bonedust, Animal Charcoal and Oils, Blood, Ammonia, Glue, Fat, Tallow, Stearine, Honey, Wax, Soap, Candles, Varnishes.*

358 BLANCHARD, CHARLES, 39 *William-st.*, *Melbourne.*—Colonial-made Saddles. By Exhibitor.
359 BREARLEY BROTHERS, *Malop-st.*, *Geelong.*—Colonial-manufactured Leathers for Saddlers and Shoemakers.
360 BRODIE, DAVID, 5 *Elizabeth-st. N.*—Harness Collars. By the Exhibitor.
361 BROWN, A. G., *Dunolly.*—Bees' Wax.
362 CHAMP, W., *Penal Establishment*, *Pentridge.*—Case of Boots. Made by Prisoners taught at Pentridge Penal Establishment.
363 CLARK, CANDID, 303 *Elizabeth-st.*—Kangaroo Stock-thong and Girth.
364 CLARK, JOHN, AND SONS, 137 *Elizabeth-st.*—Leather of various descriptions. Manufactured by Exhibitors.
365 COLLINGWOOD BOOT FACTORY.—Boots and Shoes.
366 DOUGLAS, ALFRED, AND CO., *Geelong.*—Roll Morocco and Fancy Leather.
369 FARRELL, JAMES, 7 *Post-office place*, *Melbourne.*—Leather.
370 FITTS, C., *Sandridge Glue Works.*—Glue Size and Foot Oils. Manufactured by Exhibitor.
372 GOSSAGE BROTHERS, *Footscray.*—Colonial-manufactured Soaps.
373 HALLENSTEIN AND CO., *Footscray.*—Tannery and Leather.
374 HATTON, J., *Elizabeth-st.*—Set of Cab Harness.
375 HAYES, P., *Footscray.*—Sample of Kerosene Oil.
376 HOBSON'S BAY SOAP AND CANDLE COMPANY.—Purified Tallow, Tallow and Composite Candles, Household and Toilet Soaps.
377 HONNEUS AND CO., *Maldon.*—Samples of Glue. Manufactured at the Maldon Glue Works.
378 KENNEY, G. E. A., 67 *Stephen-st.*—1 Model Saddle, made on Colonial Tree; 1 Saddle, fitted with Kenney's Patent Spring Bars; 1 Pair Patent Spring Bars.
379 KERR, THOMAS, *Footscray.*—Saddlery (colonial manufacture).
380 KILLMEISTER AND PURDUE, *Lydiard and Main sts.*, *Ballarat.*—Assorted Harness and Saddlery.
381 KITCHEN, T., AND SONS, *Sandridge.*—Samples of Soap, Candles, Tallow, &c. Manufactured by Exhibitors.
382 LANCE, EMILE, 96 *Flinders-lane E.*—Ladies' and Gentlemen's Boots and Shoes. Manufactured by Exhibitor.
383 LOADER, THOMAS, AND CO., 193 *Elizabeth-st.*—Saddlery, Halters, Kangaroo and Green-hide Thongs and Girths. Manufactured by Exhibitors.
385 MARTIN, JAMES, 22 *Swanston-st.*—Side Saddle. Designed and manufactured by Exhibitor.
386 M'FARLAND AND SONS, 305 *Lonsdale-st. W.*—Harness and Saddlery.
387 M'GUIGAN, JOHN, 83 *Collins-st. E.*—Boots and Shoes made from Wallaby skins, and dressed like French kid; boots made on blocks modelled to the feet.
388 MILLS, JAMES, 59 *Cardigan-st.*, *Carlton.*—Kangaroo Stock Whip, Dog Leads, and Green-hide Albert Chain. Manufactured by Exhibitor.
389 MOULD, CHARLES, AND CO., *Melbourne.*—Jockey Boots, Military Riding Boots, Promenade and Dress Wellington Boots, Grain-leather Waterproof

Shooting Boots, Wallaby Dress Boots, Russet Calf Balmoral Boots, Silk Top and Full-dress Boots, Morocco Oxonian Shoes, Ladies' White and Red Morocco Boots, Ladies' Bronze and Black Walking Boots, Calf and Glace Kid Boots, Walking Boots, Kangaroo Double-sole Boots.

390 MURPHY, MICHAEL, 38 *William-st., Melbourne.*—Colonial-manufactured Leather Portmanteau, made of Colonial Leather; Patent Colonial-manufactured Burglar-proof Portmanteau, made of Colonial Leather.

391 OATEN, JAMES, 57 *Lonsdale-st. W., Melbourne.*—Saddles. Manufactured by Exhibitor.

392 PAUSACKER AND EVANS, 32 *Lonsdale-st. West, Melbourne.*—Lady's Trunk and Portmanteau.

393 PRAAGST, GODFREY W., 205 *Latrobe-st. W.*—Stearine and Sperm Candles, and Residual Products.

394 SANDERS, JOHN, *Bay-st., Sandridge.*—Ladies' Boots. Manufactured by Exhibitor.

396 THOMAS, PAUL, 3 *Collins-st. E., Melbourne.*—Colonial-manufactured Boots.

397 THOMAS, S., 101 *Elizabeth-st.*—Case of Boots.

398 TILLEY AND CLARK, *Victoria Soap Works, South Yarra.*—Colonial-manufactured Soap. By special process.

399 TRUSTEES PUBLIC LIBRARY.—Five Specimens of Leather.

400 WILLIS, WM.—Colonial-made Saddle.

401 WINDOVER AND DAVIS, *Ballarat.*—Riding Saddles.

SECTION 13.—*Fabrics in Silk, Wool, Cotton, Hair, Flax, Hemp, Thread, Straw—Spun, Woven, Felted, or Laid—Plain or Mixed.*

402 ANNEAR, URSULA, 33 *Punt-road.*—Picture, in Needle Work.

403 BARKER, ALICE, *Napier-st., Fitzroy, Collingwood.*—Fancy Bonnet. Designed by Exhibitor.

404 CEDERBERG, EVA, *Melbourne.*—Wool Knitting and Crocheting.

405 CHAMP, W., *Penal Establishment, Pentridge.*—Blankets and Coverlets Manufactured at Pentridge from Colonial Wools.

406 CLARSON, C., 3 *Evans-place.*—Fancy and Plain Needlework.

406*a* COLE, TIMOTHY, *Moor-st., Fitzroy.*—A Picture in Silk and Wool.

407 COOKE, FANNY, *Luscombe-st., Brunswick.*—Berlin Wool Work.

408 CRONIN, BARTHOLOMEW, 39 *Victoria-parade, Fitzroy.*—Bonnet Fronts, Widows' Caps, Bonnet Shapes.

409 CRUTCH, MRS. WILLIAM, 11 *Latrobe-st. W.*—Berlin Wool Pictures.

410 CUMMINGS, MRS., *Collins-st.*—Eight Bags.

411 DICKINS, P., 82 *Hoddle-st., Collingwood.*—Knitted Bed Curtain.

412 DONAGHY, MICHAEL, *Chilwell, Geelong.*—Flat Rope, Four-strand Hawser, Laid Wormed Rope. Manufactured by Exhibitor.

413 DOUGLAS, A.—Eight Wool Carriage Mats, and six pairs Jockey Tops.

414 DOYLE, ELEANOR, *East Brunswick School.*—Berlin Wool Work and Crochet Quilt.

415 DOYLE, THOMAS, *East Brunswick School.*—Berlin Wool Work, in frame; Crochet Quilt.

415*a* DUFFY, C. GAVAN, *Hawthorn.*—Net made out of Kurragong-bark by the Blacks living between the Lachlan and Darling, for the purpose of catching Emus.

416 EVANS, THOMAS, 4 *Bourke-st. W.*—Canvas Whim Buckets, 4 to 60 gallons.

417 FLETCHER, JOHN, 105 *Bourke-st. E.*—Hats and Caps. Manufactured by the Exhibitor.

418 FORD BROTHERS, 421 *King-st., Melbourne.*—Patent Washing Hats—in white linen, for summer wear; black silk, coloured textures, and soft folding do. Exhibited by the Patentees and Manufacturers.

419 FRASER, ELIZABETH, *Creswick.*—Three Woolwork Pictures—"Abbotsford Family," "The Finding of Moses," and "The Vine-Gatherers."

420 FREEMANTLE, ANNIE, *West Melbourne.*—Picture in Berlin Wool.

421 FREEMANTLE, MRS.—Woolwork Picture—"Pillage and Destruction."

422 GOSS, CLARA, *Wellington-st., Richmond.*—Counterpane, in Crochet Work.

423 GROVER AND BAKER, 80 *Collins-st. E.*—Sewing-machine Work.

424 HALLIBURTON, J. H., 19 *Lonsdale-st. W., Melbourne.*—Scotch Tweeds, manufactured from Australian Wool.

425 HARE, ROSALIE JESSIE, *Blackwood-st., Hotham.*—Berlin Wool Work Manufactured by Exhibitor.

426 HARRISON, ELIZABETH.—Watchpocket, Gloves, Mits, &c.
427 HART, HENRIETTA, 66 *Collins-st. E.*—Picture in Berlin Wool Needlework.
428 HEWETT, MARGARET, *Bridge-st., Richmond.*—Crochet Antimacassar.
429 HUGHAN, A., *Yongera, Murray River.*—A Picture of a Ship, made of Wool.
430 KINCAID, JOHN, 128 *Nicholson-st., Fitzroy.*—Rope and Halters. Manufactured by Exhibitor.
431 LONG AND CO.—Case of Needlework—Baby Clothes.
432 MARTIN, MRS. ELLEN, *East Brunswick School.*—Berlin Wool Work, in Frame.
433 MEALY, ELIZABETH, AND DAUGHTER, 15 *Perry-st., Collingwood.*—Straw Hats and Samples of Straw Plait.
434 MILLAR, T., AND CO., *Emerald Hill.*—Ropemaking.
435 MOWLEM, SARAH, *Kay and Nicholson sts., Carlton.*—Straw Baskets.
436 NEIGHBOUR, MARY, 81 *Stanley-st.*—Wild Flowers, worked in Silk on Satin. Designed and produced by Exhibitor.
437 OATES, MISS A., *Vere-st., Collingwood.*—Crochet Work with Raised Flowers.
438 O'DONOVAN, ALICE, 69 *Madeline-st.*—Knitted Counterpanes. Manufactured by Exhibitor.
439 O'LOUGHLIN, BRIDGET, *South Yarra.*—Hand-worked Bed Cover. Worked by Exhibitor.
440 OVERTON, JAMES, *Drummer, 14th Regiment.*—Table Cover. Wrought in New Zealand (6547 pieces) by the Exhibitor.
441 PARRY, MISS, *Hawthorn.*—Woolwork Picture—"The Goldsmith's Daughter."
442 PHILLIPS, ISAAC, 12 *Gertrude-st., Fitzroy.*—Boys' Clothing, manufactured from Left-off Wearing Apparel.
443 PREVOST AND BESSIERES, 96 *Bourke-st. E.*—Wigs, Fronts, Head-dress. Manufactured by Exhibitors.
444 REES, MISS.—Specimen of Tatting.
445 ROBERTSON, JOHN, *Lonsdale-st. E.*—Specimens of Merino and Mousselaine de Laine, made from Australian wool in Paris. Dyed and finished by Exhibitor.
446 RAMSAY, J., *Emerald Hill.*—Hearthrug.
447 ROBINSON, L., AND CO., 37 *Collins-st. E.*—Mantles and Millinery. Designed and manufactured by the Exhibitors.
448 SARGOOD, KING AND SARGOOD, *Melbourne.*—Slop Clothing and Shirts.
448*a* SARJENT, JAMES, *Fitzroy, Melbourne.*—Two Pictures in Berlin Wool.
449 SAY, W. B., 11 *Madeline-st.*—Dyed Feathers, Straw for Hats, Leghorn and Straw Hats.
450 SHEEHY, JOHN, *Carlton.*—Pair of Worked Slippers.
451 SHIELS, MISS G., 82 *Hoddle-st., Collingwood.*—A Bead Table Cover. Made by Exhibitor.
452 SMITH, ELLEN, *South Yarra.*—Child's Ornamental Bed Quilt.
453 SOLCBERG, S., AND SONS, 27 *Little Collins-st. E.*—Gentlemen's Clothing. Manufactured by Exhibitors.
454 STEIN, W., 22 *Bourke-st. E.*—Exhibition Paletôt, a new design.
455 SUTHERLAND, DUNCAN, *Warrambeen, Shelford.*—Fabrics of Wool and Cotton. By Exhibitor.
457 SCOTTER, MISS, *Criterion House, Ballarat.*—Lady's Opera Bag.
458 TAIT, W. B.—Waterproof Coat.
459 TRONSON AND HILL, 35 *Lygon-st.*—Woollen Flocks and Shoddy. Manufactured by Exhibitors.
460 WALKER, W. W., *Collingwood.*—Baby's Shirt, 111 years old.
461 WALLWORTH, S., *East Melbourne.*—Hats.
462 WATSON, C., *Darebin Creek.*—Raw Silk. Grown by Exhibitor.
463 WILKINSON, MISS B. J., *Sydney-road, Brunswick.*—Netted Antimaccasar.
464 WILLIAMS, ADELINE ANN, *Victoria-st. W., Brunswick.*—A pair of Window Curtains. Knitted by the Exhibitor, who has been blind from her infancy.
465 WILSON, CHARLES, 245 *Elizabeth-st.*—Royal Standard in Silk. Manufactured by Exhibitor.

SECTION 14.—*Articles of Clothing; Lace, Embroidery, Specimens of Native Workmanship.*

466 BENJAMIN, MRS. B., 217 *Bourke-st. E., Melbourne.*—Colonial-made Stays.
467 BETHUNE, MRS., 103 *Lygon-st., Carlton.*—Stays. Made by Exhibitor.
468 BIGNELL, MARY, *High-st., Kyneton.*—Needlework and Water-colour Drawings. By Exhibitor.

469 BLACKMORE, MARK, 133 *Flinders-st. W.*—Waterproof Clothing. By Exhibitor.

470 BRIGHT AND HITCHCOCKS, *Geelong.*—Mantles and Millinery. Manufactured by Exhibitors, excepting articles specially marked as imported.

471 CARTER, WILLIAM, *Ferrers-st., Emerald Hill.*—Case containing Stamped Muslin Robe, Cape, Night-dress Top, Chemise Top, and Worked Dress; the Worked Dress shows the different processes of production, in different stages. The Exhibitor, being the inventor of Crochet, has shown the various processes gone through in producing a piece of work, and the nature of the implements used, viz.:—A mould in which movable type is cast, a pattern set up from the type, and a stereotype cast of a pattern, mounted for printing the design; also the same pattern worked out in an antimacassar. "The Royal Victoria Crochet Book," "The Royal Victoria Knitting Book," and the "Princess Royal Knitting and Crochet Book," designed by the Exhibitor, contain patterns for bread, cheese, and fish cloths, d'oyleys, &c., in crochet. The patterns worked out are exhibited in the several articles in the case. In the recess in front of the case is a pattern book, containing upwards of 1000 traced patterns, and an equal number of stamped patterns for muslin work; a small Table Cover and Watch Pocket, knitted; and a Pincushion and two Children's Caps, knitted in beads. On the right-hand end of the case, outside, 46 patterns of stamped muslin are shown; upon the left-hand end, 24 patterns of the same kind of work.

472 CHAMP, W., *Penal Establishment, Pentridge.*—Suite of Tweed Clothing, manufactured by machinery entirely at Pentridge Penal Establishment from Colonial Wool, and sewn by a Prisoner taught at the Establishment. Prisoners' Clothing of Coarse Tweed, manufactured entirely at Pentridge, and sewn by a Prisoner taught at the Establishment. Three Cabbage-tree Hats, made at the Penal Establishment, Pentridge, from the New South Wales Cabbage-tree. Smoking Cap, made by a Prisoner taught at Pentridge. Cradle Quilt, two Antimacassars, Toilet Set, one pair of Lady's Stockings, one pair of Men's Socks, two pairs of Children's Socks, Child's Frock, Wool Mat, Limerick Lace, made by Female Prisoners on board the Hulk "Success."

473 CENTRAL BOARD APPOINTED TO WATCH OVER THE INTERESTS OF THE ABORIGINES OF VICTORIA.—Aboriginal Products received from the Aborigines:—1, 12 Double-barbed Spears; 2, 1 Single-barbed Spear; 3, 6 Smooth Spears; 4, 1 Fish Spear; 5, 5 Spear Shields; 6, 2 Waddy Shields; 7, 9 Throwing Sticks; 8, 4 Stone Hatchets; 9, 6 Instruments for Throwing the Spear; 10, 11 Boomerangs; 11, 4 Waddies; 12, 1 Opossum Rug; 13, 5 Grass Bathing Bags and Grass—2 made by Maria, widow; 14, 3 Hand Nets—1 made by Old Mary; 15, 3 Grass Nets—1 made by Old King Tom; 16, 2 Grass-tree Baskets—made by Kitty; 17, 1 Basket (Krowan); 18, String made of Opossum Fur (Kaingle); 19, Pieces of Grass-tree Gum; 19*a*, 3 Canoes; 20, 5 Single-barbed Spears (Queron); 21, 3 Smooth Spears (Jerrar); 22, 9 Spear Shields (Querram); 23, 3 Waddy Shields (Malca); 24, 8 Waddies (Koodjerrong); 25, 1 Leangle (Leangle); 26, 3 Stone Hatchets (Merang, or Karga); 27, 4 Instruments for Throwing the Spear (Koorak); 28, 8 Boomerangs; 29, 1 Grass-tree (Daly Mring, or Mirram-Moong); 30, 2 sets Fire Sticks (Tealwork); 31, 1 Native Bucket (Tarnock); 32, 1 Heart of a large Fern Tree (Pollite); 33, 2 Hearts of Small Fern Trees (Kombegite); 34, 3 Opossum Rugs, one tanned (Qugar); 35, 3 Opossum Skins, two tanned (Beelwin, or Dardal); 36, 1 Wallaby Skin, tanned (Beelwin, or Dardal); 37, 2 Bear Skins, tanned (Beelwin, or Dardal); 38, 11 Baskets and Grass (Benup—Grass, Boam); 39, 2 Bags and Grass (Pandom—Grass, Poam); 40, 1 Necklace made of Reeds (Tagoon, or Koonbort); 41, Specimens of Carving; 42, Potatoes—42*a*, Oats—grown on the Aboriginal Station at Coranderrk, near Healesville, by the Aborigines living there; 43, 1 Single-barbed Spear; 44, 12 Smooth Spears; 45, 1 Waddy Shield; 46, 4 Waddies; 47, 1 Instrument for Throwing the Spear; 48, 6 Boomerangs; 49, 1 Basket; 50, 2 Spear Shields; 51, 5 Waddy Shields; 52, 24 Waddies; 53, 3 Boomerangs; 53*a*, 2 Instruments for Throwing the Spear; 54, 10 Smooth Spears; 55, 1 Waddy Shield; 56, 8 Waddies; 57, 25 Boomerangs; 58, 1 Single-barbed Spear; 59, 1 Smooth Spear; 60, 1 Spear Shield; 61, 2 Waddy Shields; 62, 5

Waddies ; 63, 3 Boomerangs ; 64, 5 Waddy Shields ; 65, 3 Waddies ; 66, 9 Leangles ; 67, 3 Boomerangs ; 68, 1 Single-barbed Spear; 69, 17 Smooth Spears ; 70, 2 Waddy Shields ; 71, 2 Waddies ; 72, 2 Boomerangs ; 73, 1 Instrument for Throwing the Spear ; 74, 1 Double-barbed Spear ; 75, 3 Single-barbed Spears ; 76, 17 Smooth Spears ; 77, 1 Spear Shield ; 78, 3 Waddy Shields; 79, 3 Waddies ; 80, 7 Boomerangs ; 81, 8 Single-barbed Spears ; 82, 5 Smooth Spears ; 83, 1 Spear Shield ; 84, 2 Waddies ; 85, 2 War Boomerangs—86, 1 War Boomerang—made by the Aborigines at the River Namoi, New England, N.S.W. ; 87, 2 Tubs (Tarnuk Bullitoo) ; 88, 1 Drinking Cup (Nobean Tarno) ; 89, 3 Bags (Peelang, or Beel-lung) ; 90, Drawings on Paper, by an Aboriginal ; 91, Photographs, Views on the Stations at Coranderrk and Framlingham ; 92, Drawing on Bark, by an Aboriginal; 92*a*, Stone Hatchets; 93, 2 Double-barbed Spears; 94, 2 Single-barbed Spears; 95, 5 Smooth Spears; 96, 2 Waddy Shields; 97, 4 Instruments for Throwing the Spear (Karrick); 98, 2 Boomerangs; 99, 6 Waddies; 100, 1 Opossum Rug, made by Nathaniel, Philip, and others; 101, 3 Kanneys; 102, 1 Necklace ; 103, 1 Basket ; 104, 2 Bags ; 105, 1 Pinafore—made by Ruth; 106, 1 Child's Frock ; 107, 1 Necklace ; 108, 2 Bags ; 109, 2 Nets for the Hair—Rebecca; 110, 1 Petticoat ; 111, 1 Bonnet ; 112, 1 Pincushion—Margaret Elliott ; 113, 1 Frock ; 114, 1 Collar and Cuffs ; 115, 1 Pincushion —Rachael Pepper ; 116, 1 Pinafore ; 117, 1 Bag—Magdalene ; 118, 1 Chemise—Topsy ; 119, 1 Pinafore—Lilly ; 120, 1 Pinafore—Elizabeth ; 121, 1 Basket ; 122, 1 Aboriginal Necklace ; 123, 1 Aboriginal Apron—Old Jessie ; 124, 1 Basket—Old Linna ; 125, 1 Doubled-barbed Spear (Mongile) ; 126, 1 Single-barbed Spear (Nandum) ; 127, 1 Fish Spear (Tirrer) ; 128, 1 Spear Shield (Geeam) ; 129, 1 Waddy Shield (Mulga) ; 130, 1 Instrument for Throwing the Spear (Kurruk); 131, 1 Waddy (Leonile) ; 132, 5 Lyl-lils (Lyl-lil) ; 133, 1 Basket (Bynnuk) ; 134, 1 Waddy (Kudgeerun). NOTE.—The articles numbered 1 to 19*a* were made by the Aborigines under the care of Mr. John Bulmer, at the Mission Station, Lake Tyers, Gippsland. From No. 20 to 42*a* were received from the Aboriginal Station at Coranderrk, near Healesville—the skins were tanned by the Blacks, and the potatoes and oats were grown on the station, the ground being tilled by the Aborigines. Nos. 43 to 49 were received from Mr. J. M. Garratt, honorary correspondent at Geelong. Nos. 50 to 53 were received from the Rev. T. H. Goodwin, Mission Station, Yelta, Lower Murray. The Aborigines at the Mission Station, Lake Wellington, Gippsland, under the care of the Rev. F. A. Hagenauer, made the weapons numbered 54 to 57. From No. 58 to 63 were received from Mr. George Houston, honorary correspondent, Gunbower, Durham Ox. Nos. 64 to 67 were forwarded by Mr. Hugh Jamieson, Mildura. Nos. 68 to 73 were received from Mr. H. B. Lane when he was honorary correspondent at Yackandandah. From Nos. 74 to 80 were received from Mr. M'Leod. Nos. 81 to 84 were received from Capt. C. A. D. Pascoe, R.N., when he was honorary correspondent at Swan Hill. From No. 85 to 92*a* are exhibited by Mr. R. Brough Smyth, Melbourne. The weapons and articles of clothing (Native and European), Nos. 93 to 125, were made by the Aborigines at the Mission Station, Lake Hindmarsh, and were forwarded by the Rev. F. W. Spieseke. Nos. 126 to 134 were received from Mr. W. Thomas, Guardian of Aborigines.

474 CLARIDGE, MRS. C. J., *Barry-st., Carlton.*—Roman Point-lace Needlework.

475 CLARKE, C. E., *Thomas-st., Richmond.*—A Knitted Lace Curtain. By Exhibitor.

476 CONROY, MRS. HARRIET, 131 *Bouverie-st.*—University Gown.

477 DECOURTET, E. SOULIE, 92 *Russell-st.*—Stays; Dressmakers' Manufactures. By the Manufacturer.

478 FINLASON, MARY, *Castlemaine.*—Imitation Point Lace. Made by Exhibitor.

479 GALVIN, JOHN, 73 *Collins-st. W.*—Hats and Caps. Manufactured and designed by Exhibitor.

480 GEACH, E., 41 *Swanston-st.*—Blonde Lace, designed and manufactured by Exhibitor ; Gentlemen's Ties and Scarfs.

482 GOODHEIM, SAMPSON, 131 *Spring-st., Melbourne.*—Cloth Caps. Manufactured by Exhibitor.

483 HARGREAVES, MRS., *High-st., St. Kilda.*—Needlework, consisting of Bed and Watch Pockets, Sofa Cushion, &c. Designed and executed by Exhibitor.

484 HENDERSON, SAMUEL, 129 *and* 130 *Spring-st., Melbourne.*—Ladies' and Children's Quilted Sun Hats, Hoods, and Crinolines. Manufactured by Exhibitor.

485 HILL, MRS. MARY C., 63 *Bourke-st. E.*—Ladies' Underclothing.

487 LEVY BROTHERS, 24 *Bourke-st. E., Melbourne.*—Miscellaneous Manufactures and Fancy Goods.

488 MARTIN, C. R.—*Flinders-lane W.*—Military and Masonic Embroidery.

490 ROBINSON, MRS., *Brunswick-st., Fitzroy.*—Ladies' Underclothing. Designed and manufactured by Exhibitor.

491 RUNGE. MINNA, *Spring-st.*—Crinolines and Ladies' Dresses.

492 STEWART, MRS., *Wellington-st., St. Kilda.*—Ladies' Stays and Belts.

SECTION 15.—*Miscellaneous.*

494 ARMSTRONG AND MERRIMAN.—Fly Trap.

495 ARNOLD, HENRY, 125 *Swanston-st.*—Myallwood Pipes. By Exhibitor.

496 ASHLEY, EDMUND, *Victoria-st.*—Meat-roasting Machine, self-basting.

497 BENNETT, N., *Clarendon-st, Emerald Hill.*—Two Pieces Atlantic Cable.

498 BOLTON, JONATHAN, *Osborne-st., Williamstown.*—Model of a Boat, with a Propeller. Designed and made by Exhibitor.

499 BORTHWICK, ALEXANDER, 36 *Market-st., Melbourne.*—Patent Anti-fouling Composition for Ships' Bottoms. Invented and manufactured by Exhibitor.

500 BERDECKER AND KNIGER, *Sandridge.*—Model of a Wine Cask, to contain 9000 gallons, as used in Europe.

501 BROCK, H., *Balmain-street, Richmond.*—Signal Rockets, Blue Lights, and Wheels.

502 BUCKHAM, JOHN, 278 *Elizabeth-st.*—A Tent, erected in open ground through Carriage Court.

503 CHAMP, W., *Penal Establishment, Pentridge.*—Seven Paper Knives; eight Table Mats, made at Pentridge from the New South Wales Cabbage-tree (Corypha Australis); four Door Mats, and Matting, made at Pentridge from the husk of the Cocoa Nut. Specimens of Sinnett, &c., of New South Wales. Cabbage-tree (Corypha Australis) plaited at Pentridge. Twelve Book Marks, made at Pentridge. Bone Figure, carved by a Prisoner at Pentridge. Four Canvas Fire Buckets, one Galvanised Bucket (fitted only). Dog Vanes, four Man Ropes, two Yoke Lines, Hammocks and Nettles, Clothes Bags, three Blocks (fitted only), made by the Boys on board the "Deborah," Reformatory Ship. Collection of Weapons of the Natives of Australia, as under—Seven Boomerangs, two Shields; three Wanners, or Spear Throwers; three Waddies, two Spears, one Nulla-Nulla, one Opossum-skin Mat. Vocabulary of Six Dialects of Aborigines of the Colony of Victoria, Australia.

504 CHARLESWORTH AND SHARP, *Sandridge.*—Improved Patent Composition for the Prevention of Fouling of Ships' Bottoms, whether iron, wood, or coppered; and for other analogous purposes.

506 DE BOHN, JOHN, *Collins-st.*—Chemical Patent Filter, for clarifying water, wine, spirits, &c.

507 EVERIST, T. J., *Upper Hawthorn.*—Portable Wine Bin.

508 FLETCHER, JOSEPH, 13 *Post-office place.*—Draper's Mantle Stand, with telescope slide; Grain Separator; Samples of wove wire Flower Stands, Bird Cages, Fenders, &c. Exhibited by the Manufacturer.

509 FRANKLYN, F. B., *Printers' Broker and Importer*, 20 *Queen-st., Melbourne.*—Printer's Large Imposing Surface. Imported.

510 FRANKLYN, F. B., *Printers' Broker and Importer*, 20 *Queen-st., Melbourne.*—Colonial Composing Frame—comprising Case-rack, Galley-rack, Galley-rest, and Desk; Rule, Lead, and Furniture Shelves, &c.; Roman, Italic, and Fancy Cases; Large Fount Cases, &c.

511 FRANKLYN, F. B., *Printers' Broker and Importer*, 20 *Queen-st., Melbourne.*—Colonial-made Printing Materials:—The Exhibition Composing Stick; Improved Rack Chase; Iron Side and Foot Sticks; Improved Locking-up Galley; Brass and Zinc Galleys, various; Improved Graduated Broadside and Jobbing Composers; Cedar Galleys, various; Mallets and Planers; Iron-wood Shooters; Brass and Zinc Column, Fancy, and Plain Rules;

Roller Stocks, from 6 in. to 36 in.; Amateur Printing Press; Specimens of Argentitype, Polytypes, Electrotypes, &c.

512 FROST, EDWIN H., 31 *Little Collins-st. W.*—Skates, colonial made. Designed by Exhibitor.

513 GIBSON, DANIEL, *Park-st., Emerald Hill.*—A Maori Canoe, made by a rebel Maori prisoner confined in Wellington, New Zealand.

514 GRAY AND WARING, 46 *Little Bourke-st. E.*—Wine Vats, Brewers' Hogsheads, Butter Tubs, Cheese Vats, &c. Manufactured by Exhibitors.

515 HARRIS, JAMES, *Sydenham Hotel.*—Sample of the last and effective Atlantic Cable.

516 HART, SAMUEL, 66 *Collins-st. E.*—Toys and Croquet Materials. Manufactured by Exhibitor.

517 HAYES AND CO., 95 *Swanston-st., Melbourne.*—Artificial Teeth, &c.

518 HENSON, W. E., *Melbourne.*—Rifle Bullet Moulds, new pattern; Ramrods, Snapcaps, Colonial-wood Gunstocks, &c.

519 HOLROYD AND RAVENSCROFT, *Melbourne.*—Reversible Sash and Frame.

521 HUTTGORN, E., 13 *Hanover-st., Fitzroy.*—Blackwood Foot Stool. Designed and manufactured by Exhibitor.

522 IRVING, GLOVER AND CO.—Slide Shutter Blinds.

523 KERNOT, W. H., 137 *Moorabool-st., Geelong.*—Preparation termed "Buttermaker."

524 LANGE, CHARLES, 64 *Collins-st. E., Melbourne.*—Artificial Teeth, &c.

524*a* LE SOUEF, ALBERT A. C., *Parliament House.*—Miniature Native Weapons, and Implements used by the Natives of Australia before the advent of Europeans. Made by Exhibitor.

525 LEVY BROTHERS, *Bourke-st.*—Perfume Fountain. (Perfume distributed gratis to the visitors).

526 LLOYD, H., *Emerald Hill.*—Model of Patent Shutters.

527 LOADER, THOMAS, AND CO., 193 *Elizabeth-st.*—Saddlers' Ironmongery. Victorian manufacture.

528 LOWE, G. G., 321 *Bourke-st. E.*—Silver Cylinder Pipe, for Absorbing Nicotine from Tobacco.

529 M'CALLUM BROTHERS, 108 *Collins-st. W.*—Colonial-made Ovens; Horse Shoes; and Stock Whip, carved handle.

530 M'LEOD, WILLIAM, JUN., *Bond-st., East Collingwood.*—Improved Beehives.

530*a* M'ILWRAITH, JOHN, *Melbourne Lead Works, Little Collins-st. E.*—Sheet Lead and Lead Piping. Manufactured by Exhibitor.

531 MARSDON AND DEACON, 213 *Smith-st., Fitzroy.*—Plasterers' Trowels and various Tools. Made by Exhibitors.

532 MEMMOT, WILLIAM, *Victoria-st., Carlton.*—Horn, &c., worked into Combs of various kinds, Shackles, Toothpicks, &c. Manufactured by Exhibitor.

533 MENALLACK, THOMAS, *Brunswick.*—Birdcage. Made of New Zealand Pine by Exhibitor.

534 MILLER, F. M'D., 131 *Westgarth-st., Fitzroy.*—Every description of Rifle and Pistol Cartridges. Manufactured by Exhibitor.

535 M'NAUGHT, WILLIAM, *Tinsmith, Chewton.*—Two Fog or Bush Horns. Made by Exhibitor.

536 MORRISON, A., *Castlemaine.*—Brooms of Native Grass.

537 MOURANT, J. S., *Melbourne.*—Wood Taps.

538 NEIGHBOUR, MR., 81 *Stanley-st.*—Indian Weapons.

539 NORMAN, R. S., *Essendon.*—A Puzzle Bird Cage. Made by Exhibitor.

540 OAT, W. B., *Globe Hotel, Swanston-st.*—Patent Beehive. Invented by Exhibitor.

541 OFFICER, C. M., *Mount Talbot.*—Native Weapons:—1. Four heavy Spears, plain; 2. Two heavy Spears, toothed on one side; 3. One heavy Spear, serated; 4. Five light Spears, glass pointed; 5. Twelve light Spears, plain; 6. Seven Boomerangs; 7. One light Shield; 8. Four heavy Shields; 9. Three pick-like Clubs; 10. Three Instruments for Throwing light Spears; 11. Six Throwing Sticks; 12. Four heavy Throwing Sticks; 13. One Walking Stick; 14. Two Stone Tomahawks; 15. Bag containing four Tomahawk Stones; 16. Two Aboriginal Skulls; 17. One Necklace; 18. One Fan of Emu Feathers; One White Kangaroo Skin.

542 OSBORN, JOSEPH, 27 *Post-office place.*—Patent Roller Skates, by which the natural motion of ice-skating is attained.

543 PAIN, MRS. H. E., *Melbourne.*—One case Ornaments, made and worn by the natives of Australia and South Sea Islands. Collected by Exhibitor.
544 PERRY, JOHN, *Melbourne.*—A Collection of Samples of Colonial Timber, bent into various forms.
545 PETIT BROTHERS, 33 *Latrobe-st. E., and* 20 *Post-office place.*—Baby's Swing Cot, new design; Picture Frame, made of willow; Wicker Perambulators, Soiled-linen Baskets, Cradles, Market Baskets, Cane Fencing Sword. Manufactured by Exhibitors.
546 PETTIGREW, WILLIAM, *Brisbane.*—Machine-made Door of Dundathe Pine.
547 PRESTON, R. C., *Carlton.*—Bird Cage.
548 REANEY AND ROBERTS, 30 *Post-office place.*—Corking Stools, Bottling Machines, Fire and Drill Proof Safes.
549 RILEY, THOMAS, *Lonsdale-st. W.*—Cooling and Filtering Apparatus.
550 ROWDEN BROTHERS, 75 *and* 77 *Russell-st., Melbourne.*—Japanned Galvanised Tinware and Ironware.
551 SCHIMMERLING, A., 106 *Bourke-st. W.*—Myall-wood Pipes.
552 SCOTSON, S., *Strathloddon, Castlemaine.*—Pick and Axe Handles, machine made.
553 SCOTT, JAMES, *Hawthorn.*—Portable Self-heating Galvanised Iron Bath, of novel construction, for Hot, Cold, and Shower, with Self-acting Supply and Overflow. Designed and manufactured by the Exhibitor.
554 SITCH, SAMUEL, *Bridge-road, Richmond.*—Gas-light Reflectors, Model of Street Lamp and Pillar. Manufactured and invented by Exhibitor.
555 STEWART, GEORGE, 40 *Little Bourke-st. E., Melbourne.*—Japanned Goods.
556 STONE, JOHN, *Napier-st., Fitzroy.*—One Front Door, Sashes and Frame, Machine-made Mouldings and Architraves.
557 TIJOU, H., 40 *Docker-st., Richmond.*—Designs for Painted Walls, to supersede paper in cleanliness and durability. Executed by Exhibitor.
558 VALOT, PETER, 26 *Lothian-st., North Melbourne.*—American Axes (colonial manufacture).
559 VICTORIA CARRIAGE COMPANY, *Yarra Bank Works.*—Massive Hammered Shafting, Wrought-iron Forgings and Uses.
561 WILLIS, WILLIAM, 31 *Little Collins-st. W.*—Wine Stove, adapted for general heating purposes. Manufactured by Exhibitor.
562 WILSON, CHARLES, 245 *Elizabeth-st.*—Royal Standard.
563 WILSON, R. J., *Blacksmith, Flemington.*—Model of the New Mode of Shoeing Horses. Manufactured by Exhibitor.
564 WOOD, ESTHER H., *Fitzroy.*—Leather Work and Shell Work. By Exhibitor.
565 ZEVENBOM AND STONE, 55½ *Flinders-lane E., Melbourne.*—Brushware.

Class V.—The Ornamental Arts.

SECTION 16.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Engravings, Carvings.*

566 ANDERSON, C., *Phœnix Hotel, Ballarat.*—Cardboard Model of York Minster.
568 APPERLY, HENRY, 20 *Barkly-st., Carlton.*—Two Gothic Spandrils. Modelled in Plaster of Paris by the Exhibitor.
569 BEDFORD, THOMAS, *Bendigo.*—The Lord's Prayer, and Belief, in Illuminated Writing.
570 BISHOP, ELLEN, *St. Arnaud.*—Velvet Painting—Basket of Roses and Vase of Flowers. Painted by Miss Bishop.
571 BOOTH, ROBERT, 214 *Bourke-st. E.*—Wood Carving.
572 BOROUGH OF ARARAT.—Banner and Emblem.
573 BOROUGH OF BEECHWORTH.—Banner and Emblem.
574 BOROUGH OF BELFAST.—Banner and Emblem.
575 BOROUGH OF BRIGHTON.—Banner and Emblem.
576 BOROUGH OF BRUNSWICK.—Banner and Emblem.
577 BOROUGH OF CLUNES.—Banner and Emblem.
578 BOROUGH OF CARISBROOK.—Banner and Emblem.
579 BOROUGH OF CASTLEMAINE.—Banner and Emblem.
580 BOROUGH OF CRESWICK.—Banner and Emblem.
581 BOROUGH OF CRAIGIE.—Banner and Emblem.

582 BOROUGH OF DUNOLLY.—Banner and Emblem.
583 BOROUGH OF EAGLEHAWK.—Banner and Emblem.
584 BOROUGH OF ECHUCA.—Banner and Emblem.
585 BOROUGH OF EMERALD HILL.—Banner and Emblem.
586 BOROUGH OF ESSENDON.—Banner and Emblem.
587 BOROUGH OF FITZROY.—Banner and Emblem.
588 BOROUGH OF GEELONG.—Banner and Emblem.
589 BOROUGH OF HAWTHORN.—Banner and Emblem.
590 BOROUGH OF INGLEWOOD.—Banner and Emblem.
591 BOROUGH OF MARYBOROUGH.—Banner and Emblem.
592 BOROUGH OF NEWTOWN AND CHILWELL.—Banner and Emblem.
593 BOROUGH OF PRAHRAN.—Banner and Emblem.
594 BOROUGH OF QUEENSCLIFF.—Banner and Emblem.
595 BOROUGH OF SALE.—Banner and Emblem.
596 BOROUGH OF SANDHURST.—Banner and Emblem.
597 BOROUGH OF SANDRIDGE.—Banner and Emblem.
598 BOROUGH OF SMYTHESDALE.—Banner and Emblem.
599 BOROUGH OF SOUTH BARWON.—Banner and Emblem.
600 BOROUGH OF ST. ARNAUD.—Banner and Emblem.
601 BOROUGH OF TARADALE.—Banner and Emblem.
602 BOROUGH OF TARNAGULLA.—Banner and Emblem.
603 BOROUGH OF WARRNAMBOOL.—Banner and Emblem.
604 BOROUGH OF WANGARATTA.—Two Banners and Emblems.
605 BOROUGH OF ARARAT.—Photographic Views and Statistics.
606 BOROUGH OF BALLARAT.—Photographic Views and Statistics.
607 BOROUGH OF BATHURST.—Photographic Views.
608 BOROUGH OF BEECHWORTH.—Photographic Views and Statistics.
609 BOROUGH OF BELFAST.—Photographic Views.
610 BOROUGH OF BRIGHTON.—Photographic Views and Statistics.
611 BOROUGH OF BRUNSWICK.—Photographic Views and Statistics.
612 BOROUGH OF BUNINYONG.—Photographic Views and Statistics.
613 BOROUGH OF CARISBROOK.—Photographic Views and Statistics.
614 BOROUGH OF CARLSRUHE.—Photographs.
615 BOROUGH OF CASTLEMAINE.—Photographic Views and Statistics.
616 BOROUGH OF CLUNES.—Photographic Views and Statistics.
617 BOROUGH OF CRAIGIE.—Photographic Views and Statistics.
618 BOROUGH OF CRESWICK.—Photographic Views and Statistics.
619 BOROUGH OF DUNOLLY.—Photographic Views and Statistics.
620 BOROUGH OF DAYLESFORD.—Photographs.
621 BOROUGH OF ECHUCA.—Photographic Views and Statistics.
622 BOROUGH OF EAGLEHAWK.—Photographic Views and Statistics.
623 BOROUGH OF EMERALD HILL.—Two Photographic Views and Statistics.
624 BOROUGH OF EAST COLLINGWOOD.—Photographic Views.
625 BOROUGH OF ESSENDON AND FLEMINGTON.—Photographic Views and Statistics.
626 BOROUGH OF HAWTHORN.—Photographic Views and Statistics.
627 BOROUGH OF HEATHCOTE.—Water-colour Views and Statistics.
628 BOROUGH OF INGLEWOOD.—Photographic Views and Statistics.
629 BOROUGH OF JAMIESON.—Photographic Views and Statistics.
630 BOROUGH OF KYNETON.—Photographs.
631 BOROUGH OF MARYBOROUGH.—Photographic Views.
632 BOROUGH OF NEWTOWN AND CHILWELL.—Photographic Views and Statistics.
633 BOROUGH OF PRAHRAN.—Photographic Views and Statistics.
634 BOROUGH OF QUEENSCLIFF.—Photographic Views and Statistics.
635 BOROUGH OF RUTHERGLEN.—Photographic Views and Statistics.
636 BOROUGH OF SALE.—Photographic Views and Statistics.
637 BOROUGH OF SANDHURST.—Photographic Views and Statistics.
638 BOROUGH OF SANDRIDGE.—Photographic Views and Statistics.
639 BOROUGH OF SEBASTOPOL.—Photographic Views.
640 BOROUGH OF SMYTHESDALE.—Two Photographic Views, and Statistics.
641 BOROUGH OF SOUTH BARWON.—Photographic Views and Statistics.
642 BOROUGH OF ST. ARNAUD.—Photographic Views.
643 BOROUGH OF TARNAGULLA.—Photographic Views.
644 BOROUGH OF TRENTHAM.—Photographs.

645 BOROUGH OF WANGARATTA.—Photographic Views and Statistics.
646 BOROUGH OF WILLIAMSTOWN.—Photographic Views and Statistics.
647 BOROUGH OF WOODEND.—Photographic Views.
648 BURGOYNE, ELIZABETH, 3 *Gaspar-place, Hoddle-st., Richmond.*—Wax Flowers. By Exhibitor.
649 CAMPBELL, DONALD.—Two Pictures—"On the Wallaby" and "The Overlander."
650 CEDERBERG, J. P., 82 *Queen-st.*—A Horse, &c., engraved on Silver Plate, and Framed with Blackwood, and Silver Frosted. Designed and manufactured by Exhibitor.
651 CHAMBERS AND CLUTTEN, *Lonsdale-st. E.*—Font (of Colonial Stone), Marble Figure, Slate Bath, Marble Table Top, Slate Flagging, &c. Colonial manufacture.
652 CHAPMAN, GEORGE, *Barker-st., Castlemaine.*—Specimens of Wood Carving by Machinery.
654 CITY OF GEELONG.—Photographic Views and Statistics.
655 CITY OF HOBART TOWN.—Photographic Views and Statistics.
656 CLARKE, MRS., *Barkly-terrace.*—A Group of Gipsies, made from common bread.
657 COMMISSIONERS OF INTERCOLONIAL EXHIBITION.—Standards of various Nations.
658 COWIE, JULIA, 9 *Royal-terrace, Nicholson-st., Fitzroy.*—Water-colour Drawings of Native Flowers.
659 CROWLEY, MRS., *Sandhurst.*—Six Vases Wax Flowers.
660 DOWLING, MARK.—One Picture—"A Shepherd."
661 EUSTACE, A. W., *Chiltern.*—Oil Painting on Gum Leaves.
662 FEARN, FRANCIS, AND BEVAN, MISS, *Dunolly.*—Painting—Flowers, in Leatherwork Frame.
662*a* FEINAIGLE, MRS.—Six Magic Lantern Slides.
663 FERGUSON, URIE AND LYON, *Glass-stainers, &c., Curzon-st., North Melbourne.*—An Early English Chancel, Decorated:—Illuminated Oil Painting, "The Last Supper;" Illuminated Tables of the Commandments, The Lord's Supper, and Creed. Stained Glass Windows in Chancel:—1—"Nativity." 2—"Passion;" 3—"Crucifixion;" 4—"Resurrection;" 5—"Ascension." (These five Lights have been executed for Casterton Church, and are exhibited by permission of Rev. Dr. Russell.) Stained Glass in Mediæval Court:—1—"Salvator Mundi;" 2—Heraldic; 3—Memorial Window in Gresaille; 4—"St. Peter;" 5—"St. Andrew;" 6—"Immaculate Conception;" 7—"Charge to Peter;" 8—"St. Paul;" 9—"St. Matthew." Designs for Stained Glass. Samples of Borders and Small Subjects, in Embossed and Stained Glass. Staircase Window in Embossed Plate Glass, for W. J. Greig, Esq., Toorak.
664 FELLOWS, MRS. T. H., *Melbourne.*—A set of D'oyleys Etchings on linen, done with marking ink and a quill pen by Mrs. C. Gray, of Nareeb Nareeb. Most of these D'oyleys have been in use for eight years, and have been washed frequently without injury to the drawings.
665 FIRE BRIGADE, *Ballarat.*—Photographic View of Brigade Operations.
666 FOSTER, C., *Arundel Cottage, St. Kilda.*—Carved Figures.
667 GASKELL, MRS., *Melbourne.*—Five Stands of Wax Flowers.
668 GIBSON, DANIEL.—Model of Chinese Junk.
669 GILES, ANNIE M., 109 *Victoria-parade, Fitzroy.*—"Lassoing Wild Horses in Mexico"—Picture. Worked with the Needle in Berlin Wool by Exhibitor.
670 GILL, C., *Sebastopol-terrace, Geelong.*—Chalk Drawings. By Exhibitor.
671 GRAY, CHARLES, *Ballarat.*—Four Pen and Ink Sketches.
672 HARWELL, CHARLES, *Inglewood.*—Burke and Wills's Monument. Carved with a penknife by Exhibitor.
673 HENRY, MRS. M., *Sandridge.*—Flowers.
674 HICKFORD, JAMES, *Brunswick.*—Oddfellows' Banner.
675 HOGARTH, JULIAN, 66 *Rosslyn-st. W.*—Silver Figures. Modelled and designed by Exhibitor.
676 HUXLEY, PARKER AND CO., *Monumental Works, corner of Russell-st. and Little Collins-st. East, Melbourne.*—Statuary Marble Mantelpiece, ornamented spandrels; carved trusses, surmounted by female heads, emblematical of Autumn; the whole manufactured by Exhibitors. Statuary Marble Mantelpiece, enriched spandrels and trusses, the frieze elaborately carved with grapes and vine leaves; the whole manufactured by

Exhibitors. Three carved Marble Letter-weights; manufactured by Exhibitors. Carved Marble Tablet for Mantelpiece—subject, "Victorian Bacchanals." Church Font, in Oamaru Stone, and Shaft of Victorian Marble. Three Specimens of Granite, as quarried from Mount Alexander.

677 JACKSON, M., *St. David-st., Fitzroy.*—Model of a State Chariot.

678 JAMES, EDWARD, 6 *Chamber of Commerce, Ballarat.*—Slate Chimney Pieces, Tesselated Floor, and Washstand Tops.

679 JOHNSON, PETER.—Penknife Wood Carving of Fork, Plate, Knife, and Spoon.

680 KELLY, MISS, *Nicholson-st., Carlton.*—Sculptured Cameos.

681 LANSLEY, WILLIAM NEAL, *Ballarat.*—Illuminated Writing on Parchment.

682 MACDONALD, RONALD, 19 *Spring-st., Geelong.*—Wax Model Portraits.

683 MACKENNEL, J. S.—Centres for Ceilings, and Models. Designed and executed by Exhibitor.

684 M'CARTNEY, GEORGE, *Victorian Railways Traffic Office.*—Facsimiles of Autographs of Eminent Persons.

685 M'DONALD, DONALD, 81 *Queensberry-st.*—Photographic Album.

686 MENDE, C. H., *Flemington.*—Architectural Ornament and Figures in Cast Metal. Partly designed and partly manufactured by Exhibitor.

687 M'GILL, W. T., 96 *Bourke-st.*—Model of Engine.

688 MORGAN, E., 87 *Little Lonsdale-st.*—Wood Carving.

689 NOONE, JOHN, *Crown Lands Office, Melbourne.*—Photo-lithographic Maps and Plans.

690 NUTT, THOMAS W., *Stephenson-st., Richmond.*—Heads for Keystones, Busts, Medallions—a Rabbit, Duckling, &c.; a Sketch for Tripod Vase and Capital. Modelled and designed by Exhibitor.

691 OSBALDISTON, T. E.—Fancy Cork Model, made of 873 pieces—"Village Scene."

692 PARKINSON, GEORGE.—Etching on Charred Wood.

693 PATERSON, JAMES S., *Simpson's-road.*—Minute Specimens of Engravings.

694 PEARSON, J. W., AND CO., 67 *Collins-st. E.*—Engraving, Lithographic Printing, and Embossing in the Building.

695 PECK, EMMA MARIA, *Carlisle-st. E., St. Kilda.*—Wax Flowers. By Exhibitor.

696 PERUGIA, A., *Latrobe-st. E.*—"Apollo Belvidere."

697 PORTER, J. W., *Tyne-st., Carlton.*—A Carved Walking Stick.

698 ROBERTS, S. H., *Melbourne.*—Specimens of Decorating and Painting.

699 SAYER, T. W., *Dunolly.*—Crayon Drawings. By Exhibitor.

700 SENNY, JAMES.—Design for Ceiling, and two Medallions.

701 SHIRE OF BEECHWORTH.—Banner and Emblem.

702 SHIRE OF BELFAST.—Banner and Emblem.

703 SHIRE OF CRESWICK.—Banner and Emblem.

704 SHIRE OF KORONG.—Banner and Emblem.

705 SHIRE OF MARONG.—Banner and Emblem.

706 SHIRE OF STAWELL.—Banner and Emblem.

707 SHIRE OF ARARAT.—Photographic Views and Statistics.

708 SHIRE OF BALLARAT.—Photographic Views and Statistics.

709 SHIRE OF BEECHWORTH.—Photographic Views and Statistics.

710 SHIRE OF BUNINYONG.—Photographic Views and Statistics.

711 SHIRE OF HAMPDEN.—Photograpic Views and Statistics.

712 SHIRE OF KORONG.—Photographic Views and Statistics.

713 SHIRE OF MARONG.—Photographic Views and Statistics.

714 SHIRE OF MALDON.—Photographic Views and Statistics.

715 SHIRE OF METCALF.—Photographs.

716 SHIRE OF MORTLAKE.—Photographic Views and Statistics.

717 SHIRE OF STAWELL.—Photographic Views.

718 STAFF, MRS. CHARLES, 91 *Swanston-st., Melbourne.*—Paper Flowers, from nature, cut with scissors; Wax Flowers, from Nature. By Exhibitor.

720 STIRLING, MISS, *South Yarra.*—Four Pictures, in wool.

722 TERREBILLING, GERMAINE.—Carved Chain and Padlock.

724 TOCKNELL, WILLIAM, 41 *Swanston-st., Melbourne.*—Ornamental Writing and Engraving, Specimens of Silver Plates.

725 VEROLI, L., *Carrara Marble Works, Latrobe-st. W.*—Mantelpiece, Limestone from Charente, France; Mantelpiece, Marble from Carrara, Italy. Workmanship Colonial. Exhibited by the Manufacturer.

726 VICTORIA RAILWAY CARRIAGE COMPANY.—Photographic Views of Railway Carriages and Workshops.

727 WIGMORE, MISS, *Parsonage, Williamstown.*—Specimens of Fern-work, on Linen.

728 WILSON, ISABELLA, 76 *Gertrude-st., Fitzroy.*—Worked Pictures. By Exhibitor.

728*a* WILSON, MRS. HENRY, *Catherine-st., Richmond.*—Ornamental and Illuminated Writing, by S. Crowther, Richmond; Frame in Ornamental Leather Work, by Exhibitor.

729 WRIGHT, J., *Sturt-st., Ballarat.*—Three Frames of Photographs.

SECTION 17.—*Plate, Jewellery, Working in Metals.*

730 BURCIRDE, W. H., *Williamstown.*—Tobacco Urn.

731 CRAMER, MR., *Queen-st.*—Hunting Watch Case. Manufactured by Exhibitor.

732 CRISP, GEORGE, 46 *Queen-st.*—Jewellery.

732*a* COOP, JAMES, 28 *Little Collins-st. W.*—Lead and Composition Gas and Water Piping. Manufactured by Exhibitor.

733 EDWARDS, WILLIAM, 85 *Collins-st. E., Melbourne.*—Colonial Silver Plate. Manufactured by Exhibitor.

734 EVETT, WILLIAM, 54 *York-st., Emerald Hill.*—Gold and Silver Leaf; Dental Foils, Gold, Platina, and Tin; Bronze Powder, Gold and Silver.

735 GAUNT, THOMAS, *Post-office place, Elizabeth-st.*—Colonial Pebble Spectacles, cut in Melbourne from Pebbles found near Beechworth, equal to Brazilian, mounted in colonial gold frames, manufactured by the Exhibitor; and also the rough Pebble before being cut.

736 HEATH, RICHARD, *Malop-st., Geelong.*—Specimens of Dental Workmanship. By Exhibitor.

737 HUGUENIN, A., AND SONS, 21 *Lonsdale-st. W.*—Watches and Detached Parts of Watches. Manufactured by Exhibitor.

738 KILPATRICK AND CO., 39 *Collins-st. W.*—Silver Plate and Jewellery. Manufactured and designed by Exhibitors.

739 LIVINGSTON, D., *Swanston-st.*—Specimens of Ornamental Work in Iron, Bronze, Zinc, and Wood, for Columns, Panels, Verandah Balusters, &c.

740 MIER, BARRAS, 77 *Swanston-st.*—Artificial Teeth and Dental Appliances.

741 NEWMAN, HENRY, 123 *Elizabeth-st.*—Alberts and Chains. Manufactured by Exhibitor.

742 POWELL, JOHN, 118 *Russell-st.*—Jewellery, Necklets, and Ornaments; Colonial Stones, set and polished by Exhibitor.

743 PURTON, E., AND CO., 106 *Elizabeth-st.*—Dies for Embossing and Specimens of Embossing; Specimens of Seal Engravings and Heraldic Designs.

744 RETTWIG, JOHN, 157 *Russell-st.*—Metal Spinning and Wood Turnery.

745 ROBOTTOM, H., 29 *Post-office place.*—A Silver Chasing, raised by hand, of an Engraving in the Vernon Gallery. Subject: "Rebecca at the Well."

746 SCURRY, JAMES.—Three Electro-plates.

747 SPINK AND SONS, 100 *Collins-st. E.*—Precious Stones of various descriptions.

748 STEPHENSON, JAMES, 11 *Bourke-st. W.*—Musical Clock and Gold Hunting Watch Case, two Bottles of Watch Oil. Colonial manufacture.

750 TWENTYMAN, G. O., 81½ *Collins-st. E.*—Specimens of Seal Engraving, Die Sinking, and Heraldic Painting. Designed and produced by Exhibitor.

752 WALSH BROTHERS, 53 *Collins-st. E.*—Silver Plate. Designed and manufactured by Exhibitors.

753 WELCH, JONATHAN, *Grenville-st., Ballarat.*—Stand for Timepiece. Designed and made by Exhibitor.

756 WILTON, JOHN, 92 *Spencer-st., West Melbourne.*—Model of the Inner Courts of the Temple of Solomon, at Jerusalem. Modelled by Exhibitor.

SECTION 18.—*Furniture and Decorations.*

757 ALCOCK AND CO., 132 *Russell-st., Melbourne.*—Two Billiard Tables; two Miniature Billiard Tables; specimens of Spiral Turned Work. Manufactured by Exhibitors.

758 ALLEN, M. A. AND C. C., *Mechanics' Institute, Prahran.*—Bronze Leather Work. Designed and manufactured by Exhibitors.

759 ASHMORE, WM., AND SONS, *Moorabool-st., Geelong.*—A Blackwood Wardrobe, enriched with Mouldings and Carved Trusses. Designed and manufactured by Exhibitors.

760 BEATSON, HUME J., *Capel-st., North Melbourne.*—Indian carved Work-box; Glove-box; Sandal Wood, carved; pair Silver Bracelets.

761 BEAUCHAMP AND ROCKE, *next Bank of Victoria, Collins-st. E., Melbourne.*—Winged Wardrobe, of colonial wood; Chest of Drawers, in colonial wood; Marble-slab Washstand, in colonial wood; Marble-slab Toilet Table and Swing Glass, in colonial wood; Window Cornice Pole, in colonial wood; Fancy White-wood Willow-seated Chairs; Conversational Chair, with Chess Table; Large Gilt-frame Pier Glasses, carved in wood, and silvered in the colony; Bedroom Suite; Conversation Chess Table. Designed and manufactured by the Exhibitors.

762 BROWN, DUNCAN, *Emerald-hill.*—Table of New Zealand Woods, inlaid.

763 BURMEISTER, LEOPOLD, 27 *Post-office place.*—Roller Chair-sleigh, for skating rinks. Invented by Exhibitor.

764 CARR AND SONS, 128 *Spring-st., Melbourne.*—Window Blinds. Manufactured by Exhibitors.

765 CARTER, C., 71 *and* 73 *Queen-st.*—Royal stamped Burnished Gold Paper-hangings. Designed expressly by Exhibitor.

766 CARY, R. D., *Argyle-st., Fitzroy.*—Ornamental Cornices, Panel and Centre Flowers.

767 CHAMP, W., *Penal Establishment, Pentridge.*—Table of Tasmanian Myrtle; Table of Tasmanian Wattle, Ebony, &c. (acacia decuriens); Table of New Zealand Woods; Round Table of Australian Woods; Chess Board and Men of Australian Woods; Case of Imitation Books of Australian Woods, made at Pentridge; Colour Box of Australian Woods, made at Pentridge.

768 CLARKE, JABEZ, *Camberwell.*—Paper Hangings. Decorative Room or Gallery Hangings, dyed sand being substituted for woollen flock.

770 CROWLEY, DENIS MARTIN, 45 *Albert-st., Eastern-hill, Melbourne.*—Drawing-room Furniture, made of Victorian Blackwood.

771 DAY, MR., *South Yarra.*—Chimney Glass, in Leather-work Frame.

772 DELLIT, JOHN, 18 *Flemington-road.*—Chairs, Sofa, and Couch. Designed and manufactured by Exhibitor.

773 DOGGETT, THOMAS, 35 *Curzon-st., Hotham.*—Tubular Screw-adjusting Bedstead. Manufactured and improved by Exhibitor.

774 DONALDSON AND CO., *Bourke-st. W.*—Suite of Drawing-room Furniture. Designed and manufactured by Exhibitors.

775 EDWARDS, J., M.L.A., *Collingwood.*—An Occasional Chair.

776 EFFEY, CHARLES, 36 *Little Collins-st. E., Melbourne.*—A Drawing-room Suite, consisting of a Settee, Lady's and Gentleman's Chairs, 8 Chairs, of blackwood and cedar, gilt in gold, and upholstered in horsehair, and covered with silk.

777 ELLEMOR, FRANCIS, 56 *Cardigan-st., Carlton.*—Graining.

778 FILLEUL, JOHN, 49 *Brick-st., Richmond.*—Three Chairs.

779 FOXEN, SELINA, *Drummond-st., Carlton.*—Leather-work Frames. By Exhibitor.

780 GRAHAM, ARTHUR, 5 *Drummond-st. S., Carlton, Melbourne.*—A Fancy Work Table, with ornamental slab, made in Auckland, New Zealand, from colonial woods.

781 HEINBOCKEL, HENRY, 83 *Smith-st., Fitzroy.*—Cedar Loo Tables.

782 HIRD, JOSEPH, *Franklyn-st.*—Brass-jointed Chairs. Invented, designed, and manufactured by Exhibitor.

783 HOLROYD AND RAVENSCROFT, *Victoria and Swanston sts.*—Reversible Sash and Frame.

784 KEM-WAH, *Little Bourke-st. E.*—One Carved Sideboard; one Picture Frame, carved.

785 LEVY BROTHERS, *Bourke-st.*—Lady's Work and Jewellery Case, with artistic painted Medallion.

786 M'LEAN, PETER, *Caple-st.*—Sideboard, made of Colonial Woods, elaborately carved to represent the natural history, rise, and progress of the colony. Designed and manufactured by the Exhibitor.

787 NEIGHBOUR, MARY, *North Melbourne.*—Cheval Drawing-room Screen. Designed and embroidered by Exhibitor.

788 PASER BROTHERS, 196 *Little Bourke-st. E.*—Billiard Table. Manufactured of Colonial Blackwood by Exhibitors.

789 RIDOUTT, THOMAS A., *Commercial-road, Prahran.*—Chess Table

790 ROBERTS AND FORD, *Round and Spiral Wood Turners, A'Beckett-st.*—Fire Screen, Stands, Candlesticks, and Flower Vases. Manufactured and turned by Exhibitors.
791 ROBERTS, R. J., 140 *Little Collins-st. E.*—Wardrobes, enriched with Huon Pine Carvings and Mouldings. Designed and manufactured by Exhibitor.
792 ROBERTS, SAMUEL HARTLEY, 116 *Swanston-st.*—Colonial Stone and Slate Mantelpieces, painted in imitation of Marbles.
793 SHEPPARD, W. G., *Ballarat.*—Embossed Mirror. Designed and embossed by Exhibitor.
794 SOLOMON, S., AND CO., *Swanston and Lonsdale sts.*—Suite of Drawing-room Furniture.
795 STANWAY, WILLIAM, 207 *Swanston-st.*—Chairs and other Furniture. Manufactured by Exhibitor.
796 STEIMLE, JOHN, *Main-st., Ballarat.*—Suite of Drawingroom Furniture, style of Louis XIV. Made of blackwood by Exhibitor.
797 STERRY, WILLIAM, AND SONS, 134 *Russell-st.*—Colonial-manufactured Venetian, Spanish, and Spring Blinds, with improvements by Exhibitors.
798 TAYLOR, JOHN GIBSON, *Sturt-st., Ballarat.*—Blackwood Bookcase. Designed and manufactured by Exhibitor.
798*a* TORAR, HARRIET E., *Geelong.*—Painted Top Lady's Work-table.
799 WASTELL, W. H. AND P., *Oakleigh.*—Leather-work Imitation of Wood Carving in alto-relievo.
800 WHITEHEAD, ISAAC, 87 *Collins-st. E., Melbourne.*—Gilt Console Tables and Glass Flower Stands, Girandoles, Picture Frames, Window Cornices, Portable Ventilating Ceiling Flowers and Decorations.
801 YOUNG, JOHN, *Melbourne.*—Altar and Altar Furniture; Figures; Font; Mediæval Works in Iron, Brass, Wood, and Stone.

SECTION 19.—*Printing, Stationery, and Bookbinding.*

802 ABBOTT, ROBERT M., 10 *and* 12 *Post-office place.*—Letter-press Printing in Colours, from Blocks Engraved by our Artists.
803 ASHMORE AND SONS.—Statistics of Native Industry.
804 BYRNES, JOHN P., *Argus Hotel, Collins-st., Melbourne.*—Collection of Postage Stamps.
805 BECHER, M. H., 17 *Swanston-st.*—Bibles and Testaments, in various Languages.
806 BLUNDELL AND FORD, 51 *and* 53 *Flinders-lane W.*—Specimens of Book, Newspaper, Tabular, Colour, Plain, Ornamental, and General Printing.
807 BOYD, CHARLES, *Sturt-st., Ballarat.*—Samples of Printing. By Exhibitor.
808 CALVERT, WILLIAM, 7 *George-st., Fitzroy.*—Electrotypes for printing purposes, and various Electro articles in copper; White Metal Castings, &c. Manufactured by Exhibitor.
809 CALVERT, W., 7 *George-st., Fitzroy.*—Process of Printing in Colours by the Type Press.
810 CLARSON AND MASSINA, 72 *Little Collins-st. E.*—Process of Stereotyping and Electrotyping; Book Work and Ornamental Printing; Printing in Colours.
811 "DAYLESFORD EXPRESS."—Specimens of Printing.
812 DETMOLD, W., 35 *Collins-st.*—Account Books, Stationery, and Bookbinding.
813 DICKER, THOMAS, 31 *Collins-st. W.*—Series of *Dicker's Mining Record.*
814 FAIRFAX, W., *Melbourne.*—Specimens of Printing.
815 HOUGHTON, A. H., 31 *Little Collins-st.*—Manufacture and Embossing of Envelopes, Die Sinking.
816 JILKS, EDWARD, *Bridge-road, Richmond.*—Specimens showing the Progress and Application of Printing in Victoria.
817 LEVEY, OLIVER, *Melbourne.*—Printing Materials, wood and metal.
818 MACFARLAN, ALEX.—Case of Stationery. Manufactured and exhibited by Alexander Pirie and Sons, Stoneywood Works, Aberdeen.
819 MERCER, GEORGE, 33 *Malop-st., Geelong.*—Account Books, and various Specimens of Bookbinding. Designed and manufactured by the Exhibitor.
820 MOLLROSS AND MELVIN, 89 *Little Collins-st. E.*—Samples of Bookbinding; Fancy Boxes made of Wood, Cardboard, Glass, and Galvanic Gilt Brass.
821 NOONE, S.—Specimens of Photo-lithography.
822 HEATH AND CORDELL, *Geelong.*—One Book of Printing, 1800 to 1809; One Book of Printing, 1866.

823 PETERSON, THOMAS, 5 *Swanston-st.*—Two old German Bibles, remarkable for binding, printing, and illustrations.
824 PRICE, FREDK., *Melbourne.*—Specimens of Copperplate Printing.
825 SANDS AND M'DOUGALL, *Melbourne.*—Stationery, Account Books.
826 SCOTT, GEORGE, 78 *Young-st., Fitzroy.*—Bookbinder's Paper-ruling Machine. Manufactured by Exhibitor.
827 STRODE, THOMAS, *Richmond.*—Specimens of Typography.
828 TROEDEL, CHARLES.—Specimens of Lithographic Printing, Bottle Labels, and Specimens of Show Cards.
829 TURNER, JOSEPH, 48 *Queen-st.*—Government and Commercial Despatch Boxes, Stationery Cases, Writing Folios, Bankers' Bill Cases, and other Leather Goods.
830 TURNER, WILLIAM, *Deputy Postmaster-General.*—Electrotyped Dies for Postage Stamps, three complete sets ; also, Specimens of Postage Stamps printed from the exhibited and other dies. Designed and produced by Francis W. Robinson, the Printer of Postage Stamps.
831 VINEY, S. W., *Exchange Reading Room, Melbourne.*—Black-letter Bible, A.D. 1567.
832 WALKER, MAY AND CO., 99 *Bourke-st. W.*—Stereotypes and Electrotypes. Exhibited by the Manufacturers.
833 WICKES, THOMAS BUTLER, 3 *Little Collins-st. W.*—Manifold Writer, Pocket-books, Leather Cases, and Tracing Paper. Manufactured by the Exhibitor.

SECTION 20.—*Architectural and Engineering Models and Drawings, Maps, Charts, Plans, and Sections.*

834 AINSWORTH, A. B., *Mining Surveyor.*—Maps of Mining District of Woods-point and Black River, showing Leases, Claims, Reefs, and Natural Features. Compiled from actual survey by Exhibitor.
835 CHRYSTY, F. C.—Drawings for Lubrication and Injection.
836 COWLING, JAMES, *Camp-creek, Castlemaine.*—Model Cottage and Garden. Made by Exhibitor. For Sale.
837 EGAN, MICHAEL, *Highett-st., Richmond.*—Architectural Model and Drawings. By Exhibitor.
838 GREENWOOD, SAMUEL, 32 *Latrobe-st. W.*—Carved Models for Caskets, the Setting of a Portrait, and Model of a Church. Designed and Carved by Exhibitor with a Pen-knife.
839 GIBBONS, SYDNEY, F.C.S., *Albert-st.*—Educational Drawings (various); a Section, prepared for Exhibitor's Classes; Magnified Microscopic Photographs from Nature, by Exhibitor.
839*a* HUGHAN, ALLEN, *Yongera.*—A collection of Weapons and some Nets prepared by Aborigines of the Murray tribes ; Canoe, made of bark of Eucalyptus.
840 MILLER, J. G.—Plans for Submarine Telegraph Cable.
841 RASCHE, W., 110 *Lennox-st.*—Architectural Designs, Drawings.
842 SMYTH, R. BROUGH, *Secretary for Mines.*—Map of the Colony of Victoria, showing the Alluvial Gold Workings, the Quartz Reefs, the Mining Districts and Divisions, &c.
843 SURVEY DEPARTMENT.—Large Raised Map.
844 TABOR, THEODORE, *Ballarat.*—Model of a Design for a Cathedral.

SECTION 21.—*Miscellaneous.*

845 BRACHE, ELISE, *Northcote.*—Bouquet of Hair Flowers. Designed and Manufactured by Exhibitor.
846 CAMPBELL AND GRAHAM, *Melbourne.*—Colonial-manufactured Wigs, Scalps, &c., &c.; Ornamental Work in Hair, &c., &c.
847 COLE, E. W., 8 *Eastern Market.*—A Tabulated View of a Work to be called *Cole's Information for the People on the Religions of the World.*
848 DAWSON, MRS.—Seaweeds, Sponges, and Shells.
849 EVE, JOHN SAMUEL, 171 *Bourke-st. E.*—Hair Work and Hair Dye.
850 GANT, H. D., *Ryrie-st., Geelong.*—Ornamental Hair Work. Designed and manufactured by Exhibitor.
851 GRIBBON, MRS. C., *Foundry Hotel.*—Pictures, in Ornamental Leather Work, Frames ; and Fancy Leather Work. Made and designed by Exhibitor.
852 GROVE, G. W.—Weather Predictions, based upon the Magnetic Survey.

853 HORNE, R. H., *Trentham, Blue Mountain.*—Recollection of the Royal Military College, Sandhurst, Surrey, being a Synopsis of Military Drawing, Studies, &c. By Exhibitor.

854 JOHNSON, THOMAS, *Bridge-st., Ballárat.*—Ornamental Hair-work. Designed and manufactured by Exhibitor.

855 LANCASHIRE, CHARLOTTE, *Court House Hotel, Hotham.*—"Joseph telleth his Dreams to his Brethren"—a Piece of Wool Work.

857 LEAR, ELIZA, *Dundas-st., St. Arnaud.*—Ornamental Work in Horsehair. Designed and manufactured by Exhibitor.

858 LOCKEYEAR, S., 91 *Bourke-st. E.*—Ornamental Hair Work.

859 LOWE, WILLIAM, *Bay-st., Brighton.*—Turnery and Toys, colonial manufacture.

860 LUSHER, ELIZABETH, *Brunswick-st., Fitzroy.*—Vase in Potochomanie; Specimens in Decalcomanie. Designed and manufactured by Exhibitor.

861 MARSHALL, GEORGE, *Collins-st. E.*—Glass Case containing Colonial-manufactured Cricketing and Archery Goods.

862 M'DONALD, E. J., *Epping.*—Original Poems in Manuscript.

863 MURPHY, M. B., *Reefers' Hotel.*—Collection of Foreign and British Stamps.

864 SARJEANT, JAMES, *Fitzroy, Melbourne.*—Two Pictures in Berlin Wool.

865 SIMMONS, W. VAZIE, *Analytical Chemist.*—Corosus or Vegetable Ivory Nuts, in their natural state, plain turned and fancy turned. All worked in the lathe by the Exhibitor.

866 SINCLAIR, MISSES, *Nelson-road, Emerald Hill.*—Leather-work and Frame; Crochet-work. By Exhibitors.

867 STEINMEYER, GUST. AD., *Piper-st., Kyneton.*—Illustration of Life on the Goldfields; Ornaments in Seaweed, Shells, and Rockmoss; Case of Stuffed Birds from the Kyneton District.

867*a* SWANTON, ANNE, *Brighton-road.*—Leather Picture Frame.

868 TOCKNELL, WILLIAM.—Four Cases Shellwork, as Fountains.

869 TRINAGE, MRS., *South Yarra.*—Magic Lantern Slides, Colonial subjects. Prepared by Exhibitor.

870 TRUSTEES PUBLIC LIBRARY.—Eleven Plates—Process of Currying Leather.

871 WARDLE, JOHN, 22 *Fleet-st., Fitzroy.*—Chinese Tapestry Picture. Procured by the Exhibitor from the Summer Palace, Pekin.

872 WATTS, HENRY, 23 *Bourke-st. E.*—Microscopic Objects of the Natural History of the Sea Coast, Warrnambool.

872*a* WILSON, E. H., 76 *Gertrude-st., Fitzroy.*—Fountain Shell-work. Designed by Exhibitor.

873 WOOD, ESTHER, *Melbourne.*—Clock, in Leather-work Case; and Leather Work.

874 WOOD, WILLIAM, 92 *Brunswick-st., Fitzroy.*—Stuffed Birds, Animals, and Reptiles; Skins and Shells (Colonial).

Class VI.—Machinery.

SECTION 22.—*Motive Machinery and Carriages.*

875 ANDERSON, HON. ROBERT STIRLING, 91 *Chancery-lane.*—Machine for Sawing Timber.

876 BENMAN, THOS., *Gas Works, Ballarat.*—A Water-pressure Engine, for Quartz Crushing or Puddling. Invented by Exhibitor.

877 BOBARDT, O., 121 *King-st.*—Saw-punching Press, complete; Tobacco-cutting Machine; Sole Knives; one Fig Saw; Shears, with Counter Shears, Wedges, and Bolster; Stand, with Wrought-iron Upright and Cast-iron Lasts; Specimens of Planing on Cast-iron.

878 BODDINGTON, ROBT., 4 *Queensberry-st.*—Improved Silk Flour Dresser. Manufactured by Exhibitor.

879 BRISCOE AND CO., 11 *Collins-st. E.*—Machine for planing, grooving, boring, moulding, tenoning, and mitring by steam power—imported; One Morticing Machine.

880 CARPENTER, WILLIAM, *Market-square, Geelong.*—Victorian Barouche. Manufactured by Exhibitor.

881 CHAMBERS, ENOCH, 40 *Little Collins-st.*—Stone Breaker, Hydraulic Pump.

882 CHRISTY, F. C., *Locomotive Superintendent of Victorian Railways.*—One Patent Piston, complete (manufactured in England), for Locomotive Engine Cylinder; and one English-made Steel Ring for same. Exhibited by Locomotive Branch of Victorian Railways Department.

One Patent Piston, complete, for Locomotive Engine Cylinder, modified. Manufactured and Exhibited by Locomotive Branch of Victorian Railways Department.

Sample Pieces of Low Moor Company's Iron, case-hardened, broken to show the thickness, converted into Steel. Manufactured and Converted into Steel by Locomotive Branch of Victorian Railways Department.

One Loom for Weaving Lubricating Pads, in one web of seven widths, for Oil Axle Boxes of Carriages and Waggons. Designed, Manufactured, and Exhibited by Locomotive Branch of Victorian Railways Department.

One Bourdon's Patent Steam-pressure Gauge, modified. Manufactured and Exhibited by Locomotive Branch of Victorian Railways Department.

One Reversing Lever for 17-inch Cylinder Locomotive Engines, case-hardened in all the working parts. Manufactured and Exhibited by the Locomotive Branch of Victorian Railways Department.

Four Gun-metal Clack Valves, complete, finished for Locomotive Engines; three Clack Balls and Seats, in the rough; three Clack Balls and Seats, finished. Manufactured and Exhibited by Locomotive Branch of Victorian Railways Department.

A Coil of English-made Lubricating Padding or Oil Axle Boxes; Axle Box, containing one English-made Pad and Frame. Exhibited by Locomotive Branch of Victorian Railways Department.

One Coil of Colonial-made Lubricating Padding for Oil Axle Boxes, modified. Manufactured and Exhibited by Locomotive Branch of Victorian Railways Department.

One Roscoe's Patent Self-acting Lubricator, for Lubricating Steam Pistons and Valves, modified. Manufactured and Exhibited by Locomotive Branch of Victorian Railways Department.

One Machine for Rough Bending Patent Piston Rings out of Bar Steel. Manufactured and Exhibited by Locomotive Branch of Victorian Railways Department.

One Machine, with Iron Rolls, case-hardened, for Trussing Patent Piston Rings, after having been roughly bent from Bar Steel. Manufactured and Exhibited by Locomotive Branch of Victorian Railways Department.

One 12-inch Universal Shaping Machine. Manufactured by Joseph Whitworth and Co., and Exhibited by Locomotive Branch of Victorian Railways Department.

One 7-inch Self-acting Screw-cutting Lathe. Manufactured by Joseph Whitworth and Co., and Exhibited by Locomotive Branch of Victorian Railways Department.

One Apparatus for Testing and Adjusting Steam-pressure Gauges. Designed, Manufactured, and Exhibited by Locomotive Branch of Victorian Railways Department.

Two Giffard's Patent Water Injectors, a substitute for Force Pumps for Steam Boilers, modified. Manufactured and Exhibited by Locomotive Branch of Victorian Railways Department.

Two Gun-metal Castings for Slide Valves, for 14-inch and 17-inch Cylinder Locomotive Engines. Manufactured and Exhibited by Locomotive Branch of Victorian Railways Department.

wo Gun-metal Slide Valves of similar dimensions to above, finished. Manufactured and Exhibited by Locomotive Branch of Victorian Railways Department.

883 CLARSON AND MASSINA, 72 *Little Collins-st. E.*—Printing Machinery, Improved.

884 CRUTCH, WILLIAM, 11 *Latrobe-st. W.*—Circular-front Brougham. Built by Exhibitor.

885 CRUTCH, WM., *Melbourne.*—One Pair Carriage Wheels.

886 CUTTER AND LEVER, *Ballarat.*—Waggonette, to carry 6 persons; Jump-seat Buggy, with spring back; Racing Sulky, weight 45 lbs.; Turnover-seat Buggy, fitted with pole and shafts; Single-top Buggy, fitted with pole and shafts.

887 DICKSON, JOHN, *Footscray.*—Pair 6-ton Purchase Blocks; Pair 3-ton Purchase Blocks; Pair 3-ton Purchase Blocks, polished, with Gun-metal Sheaves; Pair 2 ton Purchase Blocks, polished, with Gun-metal Sheaves; two Pairs 2-ton Blocks, black, with Gun-metal Sheaves.

888 DOWNIE, CHARLES, 80 *Lonsdale-st. E.*—Four Carriages. Exhibited by Manufacturer.
889 DUNN, GEORGE, 25 *Market-st., Emerald Hill.*—Rotary Water Engine. Exhibited by Inventor.
890 ELLIOTT, ANDREW, 114 *Wellington-st., Collingwood.*—Albert Car. Manufactured by Exhibitor.
891 EVE, JOHN SAMUEL, 171 *Bourke-st. E.*—Model of Traction Engine.
892 FRANKLYN, F. B., 20 *Queen-st.*—Presses for various modes of Printing.
893 GOERNEMAN, MR., *Latrobe-st.*—One Buggy.
894 GOODHEIM, SAMUEL.—Sewing Machine.
895 HACKETT, JOHN, *Fitzroy, Melbourne.*—Colonial-manufactured Carriages.
896 HART, HENRI J., 8 *Queen-st.*—Machine for Manufacturing Horse-shoe Nails from Cold Iron.
897 HENDERSON, EDWARD, AND CO., *Little Collins-st. W.*—Turbine Wheel and Centrifugal Pump. Manufactured by the Exhibitor.
898 HOPE, ARTHUR, *Prahran Foundry.*—Model of Hope's Patent Compound Stamp Mill for Quartz-crushing.
899 LANCASTER, HENRY, *Victorian Railway Sheds.*—Model of Steam Engine.
900 LONG AND CO.—Self-acting Coffee Roaster.
901 LOWE, J. E., 18 *Coventry-st., Emerald Hill.*—Reciprocating Water-pressure Engine, capable of 300 revolutions per minute. Invented by Exhibitor.
902 LUGTON, ALEXANDER, 144 *Little Lonsdale-st.*—A Butcher's Sausage and Chopping Machine. Improved by Exhibitor.
903 MANFORT, T. D., 121 *King-st., Melbourne.*—Apparatus for Lifting Railway Rolling Stock on the Rails after being thrown off. Invented by Exhibitor.
904 MARSDEN, J. T. S., 20 *Queen-st.*—Four Samples of Mill Bands. Invented by Exhibitor.
905 MAYNARD AND FISHER, *Hanover-st., Fitzroy.*—Public Safety Conveyance. Designed by the Exhibitors.
906 M'GREGOR AND AGNEW, 245 *Swanston-st.*—Three Carriages. Exhibited by Manufacturers.
907 MILLAR, G. S., *Engineer, Fitzroy.*—Millar's apparatus for preventing Steam Boiler Explosions.
908 MILLER, ROBERT, 1 *Latrobe-st., Melbourne.*—Carriages.
909 M'KAY, JOHN, 86 *Collins-st., W.*—Horizontal Engines, for Steam or Water; Hydraulic Reaction Turbine; Patent Reflectors. Designed by Exhibitor.
910 MORTON, W., *Lygon-st.*—Model of a Pontoon Bridge.
911 MUSGRAVE, JAMES, *Oaklands Junction.*—Wooden Models illustrative of the Principle of a Proposed Electro-magnetic Engine. Invented by Exhibitor. Accompanied by Essay on Use of Electro-magnetism as a Moving Power.
912 NIMMO, JAMES, *Chief Engineer Steamship "Barwon," Melbourne.*—Models of Propellers for Steamships.
913 PARROT, FREDERICK, *Market-square, Geelong.*—Carriage.
914 PROCTOR, W., *Ballarat.*—Ascot Car.
915 PURTON, E., AND CO., 106 *Elizabeth-st.*—Printing Machine in work, showing the process of letter-press printing.
916 REED, JAMES, *Young-st., Fitzroy.*—Flax Machine for New Zealand Flax.
917 ROBINSON, T., AND CO., *Melbourne.*—Improved Wine Press; Improved Grape Mill; Self-regulating Wind Engine, for Irrigating, Pumping, &c.; 35-gallon Wood Water Bucket, self filling and discharging; 45 do., do.; Vertical Wool Press; Grass Seed Drill, with flexible tubes; Cultivator, with Grass Seed Drill combined; 3 Improved Iron Earth Scoops, for station use; 2 Wood Ploughs, for station use; Deep Trench or Vineyard Plough; Patent Smut Machine for Cleaning Wheat; Stripping Machine, with patent lever comb for threshing grain in the field; Improved Mowing Machine; Thrashing, Riddling, and Cleaning Machine; Barrow; Broadcast Seed Drill; Improved Waterlift.
918 SAMWELLS, HENRY, 130 *Flinders-lane E.*—A Buggy constructed to Carry Two or Four Persons.
919 SANDS AND M'DOUGALL.—Railway Ticket Printing Machine.
920 SATCHELL. JOHN, 3 *Cobden-st., Emerald Hill.*—Working Model of Locomotive Engine.
921 SCHULTZ, CARL T., *Talbot.*—Steam-engine saving twenty-five per cent. of steam. Invented by Exhibitor.

923 SMITH, ALEX. K., *Carlton Foundry.*—Self-acting Water Lift. Invented, designed, and manufactured by Exhibitor.
924 SMYTH, R. BROUGH.—Model of a Portable Crusher and Amalgamator.
925 SPRINGHALL, JOHN, *Williamstown.*—Model of Marine Engine and Boiler.
926 STANFORD AND CO., *Bourke and Russell sts.*—Singer's Button-hole Machine. Imported. At work in Machinery Department.
927 STEVENSON AND ELLIOT, 177, 179, *and* 181 *King-st.*—Colonial-manufactured Carriages; Section of a C Spring Barouche, Showing the Action of a Newly-invented Self-acting Step and Carriage Springs.
928 STEWART, JOHN, 190 *King-st.*—Spring Dray, improved. Manufactured by Exhibitor.
928a TAYLOR, HERBERT, 33 *Swanston-st.*—Model of a Steam Engine.
929 TRONSON AND HILL, 35 *Lygon-st.*—Rag-grinding and Flock-making Machine. Imported.
930 VICTORIA CARRIAGE COMPANY, *Collins-st.*—Two Carriages.
931 VICTORIA CARRIAGE COMPANY.—A Machine for Turning Axe Handles. Imported.
932 WILKIE, WELCH AND CO., *Melbourne.*—The Motive Power employed for the Working Machinery is supplied by these Exhibitors, and is as follows:—Twenty horse-power Portable Engine, by Clayton, Shuttleworth and Co., of Lincoln, with Patent Safety Valve; Sixteen horse-power Portable Engine, by Clayton, Shuttleworth and Co., with Reversing Link Motion, Patent Safety Valve; Four horse-power Portable Engine, by Clayton, Shuttleworth and Co., with Patent Safety Valve and Enlarged Fire Box.
933 WORDSWORTH, A., 149 *Swanston-st.*—Disc Water-engine. Manufacturer and Patentee.

SECTION 23.—*Mining, Metallurgical, Chemical, Philosophical, Surgical, Musical, Machinery and Instruments.*

934 ABRAHAM, JOHN, *Railway-cottage, Melbourne-road, Ballarat.*—Low-water Alarm for Steam Boilers; New System of Winding. Designed by Exhibitor.
935 ALCOCK AND CO., 132 *Russell-st., Melbourne.*—Lathe for Turning Ivory.
936 ANDERSON, WILLIAM, *Bond-st., South Yarra.*—Pianoforte. Manufactured by Exhibitor.
938 BLAZEY, WM. R, *Richmond.*—Colonial-manufactured Pianofortes.
938a BOLTON, JONATHAN, *Osborne-st., Williamstown.*—Model of an arrangement of a Telescope for taking views.
939 CHRISTENSEN, C., *Deep Creek.*—Cylindrical Puddling Machine and Cradle.
940 CLUBB, MR. AND MRS., *Melbourne.*—Colonial-manufactured Trusses, with Improvements by Manufacturers; Surgical Appliances.
941 DEVEREUX, JOHN, 18 *Marian-st., Fitzroy.*—Violin, long pattern, improved tension bar; Viola di Gamba, from model of Antonius Stradinarus's Violin. Made by Exhibitor.
942 ELDER, HENRY, 63 *Bourke-st.*—Eight-day Clock (3-feet dial), seconds pendulum, dead-beat escapement, striking hours on three bells, suitable for a town hall or railway station, colonial-made, Huon-pine case; colonial-made Eight-day Clock (3 feet dial), dead-beat escapement, colonial-made, for railway station.
943 FINCHAM, GEO., *Richmond.*—Organ—contains compass CC to G 56; Pedal, CCC to E 29. The organ is built on a new principle, which insures a light touch. The whole of the organ is built in the colony, and the metal pipes which are spotted were cast at the factory, Richmond-road. The organ is prepared to carry three sound-boards.
944 FORSHAW, G., AND CO., 47 *Flinders-lane W.*—Wine-maker's Still and Rectifier.
945 GAUNT, THOMAS, 5 *Post-office place.*—Eight-day Chronometer, with Colonial-made Case (on an improved principle).
946 GIBBONS, SYDNEY, F.C.S., 6 *Albert-st.*—Philosophical Apparatus, various.
947 GOBY, ARTHUR, 118 *Lonsdale-st. E.*—Portable Still, and two Small Models. Designed in Melbourne.
948 GOVER, H. B., 36 *Grattan-st.*—Violins, Viola, Violoncello, with improved tension bars; Four-string Double-Bass, made of colonial Cedar and Blackwood.
949 GROVER AND BAKER, 24 *Swanston-st.*—Sewing Machines.
950 HEBBLEWHITE, S., AND CO., 31 *Swanston-st.*—Two Sewing Machines.

951 JONES, JOHN, 106 *Lonsdale-st. E.*—Colonial-made Surgical Instruments, Trusses, Spinal Supports, Club-foot Instruments, Ladies' and Gentlemen's Belts, Stockings, and Knee Caps. Made by Exhibitor.

952 LEVY BROTHERS, *Bourke-st.*—Large Hall Clock, with bronze figure and patent rotary compensating pendulum, open face, striking hours and half-hours; French Clock, with mechanical singing bird; Lady's Workbox, fitted with casket containing mechanical singing bird; Large Musical Box, playing twelve tunes, reed notes, with organ accompaniment, and bells, castanets, and drums; Large Case, with mechanical dancing figures, musicians, clock, &c., fitted with musical box and drums. Imported, and not for competition.

953 LONG AND CO., 166 *Bourke-st. E., Melbourne.*—Sewing Machines by Wheeler and Wilson, enclosed in Cabinets of colonial wood and manufacture.

954 LONG AND CO., 166 *Bourke-st. E.*—Knitting Machines.

956 NICHOLAS, H. C., *High-st., St. Kilda.*—One Five-octave Harmonium; one Portable Harmonium. Manufactured by Exhibitor.

957 PARTRIDGE, JOHN, 86 *Chancery-lane.*—Improved Semaphore Clock, with Sympathetic Dial.

958 PEARSON, C. K., *High-st., Avoca.*—Improved Regulator for Patent Lever Watch, with Compensation Adjustment to keep the Watch or Chronometer going at same rate in every degree of Temperature and in all Positions. Invented and manufactured by Exhibitor.

959 POSTAL, J. D., *Hawthorn Grammar School.*—Model of Machine for Crushing and Grinding Quartz.

960 ROBERTS, J., *Nelson-st., Williamstown.*—Working Model of Windlass for deep sinking.

961 SCHREIBER, HENRY, 110½ *Queen-st.*—Mathematical Instruments.

962 SCOTT AND CO., 113 *Flinders-st.*—Rectifying Still. Made by the apprentices of the Melbourne Copper Works.

963 SEVERN, H. A.—Intensity Coil.

964 SMITH, ALEX. K., *Foundry, Carlton.*—Water Hoist, for wind or steam power.

965 SMYTH, R. B., *Secretary for Mines.*—One horse machine for reef testing; invented by J. Phillips, mining surveyor, St. Arnaud. One Fluviometer, for measuring water; constructed by J. Phillips.

966 WALTERS, J., *Pleasant Creek.*—Pin Leg, with knee joint.

967 WILCOX AND GIBBS, *Broadway, New York, U.S.A.*—Sewing Machines, in colonial cases. Samuel Hebblewhite and Co., 31 Swanston-st., Melbourne, Exhibitors.

968 WILKIE, KILNER AND CO.—1—Colonial-made Cottage Grand Piano, three unisons throughout, elegant walnut case, with emblematical carving in front, patent metallic bridge and extended sounding board, carved wood trusses, gilded. 2—Full-sized Cottage Piano, three unisons, made of colonial wood and materials throughout, elegant blackwood case, carved front, patent metallic bridge, carved trusses, extended sides. 3—Cottage Piano, walnutwood case, French model, three unisons, brass bridges, iron bracings. 4—Cottage Piano, muskwood case, trichord treble, colonial material throughout, brass bridge. 5—Cottage Piano, blackwood case, three unisons, brass bridge, carved trusses, iron bracings. 6—Cottage Piano, blackwood case, three unisons, brass bridge, extended sounding board, colonial material throughout, iron bracings. 7—Cottage Piano, pine case, colonial material. 8—Cottage Pianette, solid blackwood, colonial material. 9—Pianette for the Study, pine case, colonial material throughout, trichord metallic bridge. Set of colonial-made Keys for Piano, Strings for Piano, and Samples of Colonial Woods.

969 WILKINSON, DAVID, *Prahran.*—Amalgamator.

SECTION 24.—*Agricultural and Horticultural Machines and Implements.*

970 BUNCLE, JOHN, *Parkside Machine Works, Hotham.*—Patent Chaffcutting Machinery, Maize and Oat Crusher, and Horse Works. Manufactured by Exhibitor.

971 HENDERSON, THOMAS, AND CO., *Elizabeth-st. N.*—Reaping and Mowing Machine combined; Winnowing Machine. Improved and manufactured by the Exhibitors.

972 HOME, J. W., *A'Beckett-st., Melbourne.*—Patent Travelling Box Woolpress, Wine Press, Grape Mill, Four horse-power Bone Mill. Designed and manufactured by Exhibitor.
973 LEMON, HUGH, *Elizabeth-st., North Melbourne.*—Two Ploughs and a Vineyard Plough.
974 LUGTON, ALEXANDER, 144 *Little Lonsdale-st. E.*—An improved Road Scraper. Exhibited by the Manufacturer.
975 MAPLESTONE, C., *Ivanhoe Lodge, Heidelberg.*—Improved Grape Crusher.
976 SEELING, H., *Keilor.*—Horse Hoe Machine. Wine Strainer.

SECTION 25.—*Naval, Military and Engineering, Civil Engineering, Architectural, and Building Contrivances.*

977 ANDERS, J. J., 58 *Little Oxford-st., Collingwood.*—Model of River Boat.
978 ARMSTRONG AND MERRIMAN, *Elizabeth-st.*—Henry's Repeating Rifle—can be fired 15 times in 10 seconds, without removing from the shoulder; Five-chambered Revolver, carrying ten charges.
979 BAILEY AND ROBERTSON.—Earth Closets.
980 BALLENGER, JAMES, 111 *Bouverie-st., Carlton.*—Model of the "Aldinga."
981 BATES, J. N., *Drysdale.*—Life-Boat. Original design.
982 BOLTON, JONATHAN, *Osborne-st., Williamstown.*—An Instrument to Ascertain the Local Attraction of Compass on Land or at Sea, and Correct the same; also for other scientific purposes. Invented by Exhibitor.
983 BROWN, DAVID, 297 *Victoria-parade, Collingwood.*—An Improved Earth Commode Machine. Invented by Exhibitor.
984 BROWN, JAMES, 172 *Lonsdale-st. E.*—Improved Earth Closet. By Exhibitor.
985 BROWN, WILLIAM, *Iron Works, East Collingwood.*—Tobacco-cutting Machine. Improved and manufactured by Exhibitor.
986 BRIGHT BROTHERS, *Melbourne.*—Midship Section of steam-ship "Salamander," built at Melbourne.
987 BROWN, JAMES, 172½ *Lonsdale-st. E.*—A new Projector for Discharging Chain Shot.
988 COLLINS, G. K., *Sandridge.*—Two Jack Screws, for wool.
989 COLLINS, G. K., *Sandridge.*—Models of H.M.S. "Victoria" and "Royal George."
990 COOKE, EDWARD F., *Office of Titles, William-st., Melbourne.*—Model of Peninsular and Oriental Steamship "Jeddo," 1109 tons, 450-horse power.
991 DANKS, J. S., 42 *Bourke-st. W.*—Pumps and Machinery.
991*a* DEVONSHIRE, R. BARRETT, *Ballarat.*—Model of a Cylinder Boat.
992 DRAPER AND SONS, 83 *Bourke-st. W.*—Earth Closet Commodes, self-acting. By the Patentees.
993 EDGLEY, MR., *Emerald Hill.*—Model of Yacht.
994 EDWARDS, JAMES, *Prince's Bridge.*—Imported Outrigger Boat.
995 FIRMAN, W. H., 268 *Smith-st.*—Solid Cork Lifebuoys and Belts. Manufactured by Exhibitor.
996 FRASER, ALEXANDER, *Francis-st., East Collingwood.*—Instrument for Earth Closets. Manufactured and invented by Exhibitor.
998 GREENLAND, W., *Punt-road, Richmond.*—Model of Eight-oared Shallop, for rivers and lakes.
999 HANSON, C., *Melbourne.*—Model of Full-rigged Ship. By Exhibitor.
1000 HART, SAMUEL.—Model of Canoe, made of vellum.
1001 HEATH AND JACKSON, *Geelong.*—Models of Yachts, in frames.
1002 HENSON AND CO., 98 *Bourke-st. E.*—Regulation Enfield Rifle, altered to Prussian Needle Breech-loading; Working Model of New Breech-loading Cannon; Kangaroo Bullet, Rotary Rifle, designed, invented, and manufactured by Exhibitor.
1003 HENSON, W. E., *Melbourne.*—Bullet-compressing Machine.
1004 IRVING, GLOVER AND CO., *Raglan-st., Ballarat.*—Models of Vertical and Horizontal Spring-steel Band Sliding Shutters. Invented and manufactured by Exhibitors.
1005 JERVIS, JAMES, *Shipwright, Williamstown.*—Half Model of an Intercolonial River Steamer. By Exhibitor.
1006 KERNOT, W. C., 3 *Hotham-st., East Melbourne.*—Design for a Girder Bridge; and Model Girder for the above.

1007 LADNER, GRACE.—Model Vessels.
1008 M'GILL, W. T., AND CO., 96 *Little Bourke-st. W.*—Iron Patent Earth Closet.
1009 MILLER, F. M'D., 131 *Westgarth-st., Fitzroy.*—Machine for Filling Pistol Cartridges. Invented by Exhibitor.
1010 PATENT EARTH CLOSET COMPANY, *Spencer-st.*—Mould's Patent Earth Closets.
1011 PRENTICE, J., AND CO., *Stowmarket, Suffolk* (per J. E. Knight).—Guncotton prepared for various purposes—viz., fowling charges and cylinders, charges for coal, blasting, waterproof mining, charges with fuse, covered mining charges. Reel of Yarn, Model of Cannon Charge, Reel of Cartridge Cotton, Cotton Rope.
1012 SEEL, JOSEPH, *Young-st.*—Working Model of Steamship "Adriatic."
1013 SEEL, JOSEPH, *Young-st.*—Model of Boat used by the Natives of Ceylon to convey passengers to and from ships.
1014 SELLE, C. H., *Canning-st., Carlton.*—Machine for Making Stearine and other Candles; Hand-frames on Improved Principles.
1015 SEVERN, H. A., *Union Bank of Australia.*—Model of Floating Rocket Ram, a new Projectile for the Defence of Harbours and Destruction of Vessels. Self-acting Electro-Magnetic Alarm Mariner's Compass—a captain may *hear* if the vessel is taken off a set course. Designed by Exhibitor.
1016 SEVERN, H. A.—Model of a Life Boat.
1017 SNEE, CAPTAIN W. H., *Local Staff Volunteer Force, Victoria.*—One 40-lb. Armstrong Gun; One 12-lb. Armstrong Gun; One 6-lb. Armstrong Gun; One 3-lb. Whitworth Gun; Shot and Shell of every description, cut in sections and uncut; Fuzees of every description, cut in sections and uncut; and various other things connected with the service of ordnance. Rifles old and new patterns; Photographs of Guns, &c., taken by the War Department in England; Model Field Gun, made by Armourer-sergeant Newman, R.V.A.R.; Model of a Pontoon Bridge, by Instructor — Morton, Engineer Corps; Gun Barrels, showing interior; also Miller's Apparatus for making bullets; Case containing samples of Bullets, Cartridges, &c.; Case containing Stocks of Guns, by Henson; together with an Enfield Rifle converted into a Needle Gun.
1018 STANESBY, G. H., 71 *and* 73 *Fitzroy-st.*—Earth Closets.
1019 STEPHENS, J., 92 *Elgin-st., Carlton.*—Model Yacht.
1020 SUTHERLAND, DUNCAN, *Warrambeen, Shelford.*—Model of a Ship.
1021 THOMPSON, MR., *Williamstown.*—Model of Schooner; one case Models; two Half Models; Models of Sailing Vessels.
1022 VICTORIA MODEL-YACHT CLUB.—"Amateur," cutter, second class, Hugh M'Culloch; "Carico," schooner, first class, Thomas James; "Crest of the Wave," schooner, second class, Edward Edgley; "Divina," schooner, first class, R. B. Coombes; "Emma," cutter, first class, Henry B. Tray; "Foaming Billow," schooner, first class, R. B. Coombes; "Melbourne," schooner, first class, John Cosgrave; "Nautilus," schooner, second class, James Swinbourn; "Sylph," schooner, first class, Donald M'Leod; "Secret," schooner, J. J. Anders; "Young Harry," cutter, first class, J. J. Anders.
1023 VICTORIAN VOLUNTEER ENGINEERS, *Melbourne.*—Model of a Bridge of Casks; scale, ½-inch to the foot. Constructed by the V. V. Engineers, at the Sunbury Encampment, 1866.
1024 WHITE, M. G., *Williamstown.*—Models of Ships.
1025 WILSON, MR., *Melbourne.*—Two Models of Floating Batteries.
1027 WOODWARD, GEORGE, 21 *a'Beckett-st. E.*—Deodorising Portable Tank Closet and Night Commode, constructed for the special use of Woodward's Patent Deodoriser and Disinfecting Powder.

SECTION 26.—*Miscellaneous.*

1028 BOWLEY AND DEAN, 83 *Latrobe-st. W.*—Frame Knitting Machines.
1029 BROWN, JAMES, 172½ *Lonsdale-st. E.*—Improved Churn for Making Butter.
1030 CROWTHER, JAMES, *Fitzroy.*—Scale, Beam, and Cramp.
1031 DIERMISSEN, C., 5 *Albert st.*—Cork and India-rubber Engine-packing.
1032 DODGSON, G. E., *Simpson's-road, Collingwood.*—Male and Female Axles. Manufactured by Exhibitor.

1033 EYRE, WILLIAM, 116 *Collins-st.*—Diagonal Steam Boiler.
1034 FULTON AND SHAW, *Fulton's Foundry.*—Wool Presses. Designed and manufactured by the Exhibitors.
1035 FRANKLYN, F. B., *Printers' Broker and Importer*, 20 *Queen-st.*, *Melbourne.*—Hopkinson's Albion Press, imported, showing improved locking up; Rack, in use, colonial.
1036 GRIFFITHS, W. T., *Lonsdale-st. W.*—Timepiece, on a New Principle. Manufactured by Exhibitor.
1037 HALL, W., *Carlton.*—Amalgamator.
1038 HARRISON, JAMES, *Nicholson-st.*, *Simpson's-road.*—Direct Railway Accident Communicator. Invented by Exhibitor.
1039 HOUGHTON, W. G., *Richmond.*—Perambulators.
1040 KNIGHT, J. G., F.R.I.B.A.—Robinson's Patent Cask-washing Machine for Victoria. Patented by Exhibitor.
1041 KNIGHT, J. G., F.R.I.B.A.—Portable Gasworks for country districts and private dwellings. Invented by Exhibitor. Imported.
1042 LUGTON, ALEXANDER, 144 *Little Lonsdale-st. E.*—A Calf and Lamb Blowing Machine; Tobacco-cutting Machine, for Hand-power.
1043 MOORE, F. F., *King-st.*, *Melbourne.*—The Press used by the Hon. J. P. Fawkner for Printing the *Colonist*, the First Paper Published in Melbourne.
1044 MONSTER CLOTHING COMPANY, 21 *Bourke-st. E.*—Model of Cloth-shrinking Machine and Drying Apparatus. Exhibited by the Inventor.
1045 PAGE, FREDERICK, 165 *King-st.*—Model of Spark-catcher. Invented and made by Exhibitor.
1046 PRATT, ANDREW, 159 *King-st.*, *Melbourne.*—Butter Churns and Wash Boards.
1047 PRESTON, R. C., *North Melbourne.*—Painter's Machine, Man Helper.
1048 SAKER, G., *Dover-road*, *Williamstown.*—Sausage Machine.
1049 SAY, W. B., 11 *Madeline-st.*—Roller Skates and Fog Signals. Made by Exhibitor.
1050 STONEMAN, E., *Stephen-st.*, *Richmond.*—Carriage Springs. Made by Apprentice.
1051 STONEMAN, HENRY, *Stephen-st.*, *Richmond.*—Carriage Springs, of New Design.
1052 THOMAS, L., *St. Arnaud.*—A Pair of Wheels of Indigenous Wood, designed to prevent Dishing. Manufactured by Exhibitor.
1053 TURNBULL, THOMAS, *Richmond-road.*—Churns, Trucks and Carriage Lifts. By Exhibitor.
1054 VICTORIA CARRIAGE COMPANY, *Yarra Bank Works.*—Two Axles.
1055 WORDSWORTH, A., 149 *Swanston-st.*—Patent suspended Weighing Machine, for Weighing Goods Discharged from Ships without taking them off the crane.

Exhibits Improperly Described or Owners Unknown.

1056 Specimens of Quartz.
1057 Two Bundles of Leaf Tobacco.
1058 Bag Wheat.
1059 Barley, in glass case.
1060 Sample Oats.
1061 Sample Barley.
1062 Sample Barley.
1063 Case of Wool from Stawell.
1064 Six Bottles one and two year old Wine.
1065 Two dozen Reisling and Hermitage, vintage 1866.
1066 Six Bottles Mount Alexander Red Wine.
1067 One dozen Sweet Water Wine.
1068 One dozen Red Wine.
1069 Samples of Slate.
1070 Two hogsheads Ale and Porter.
1071 Basket of Needlework. Samples of Darning.
1072 One Frame Photographs (Churches).
1073 Canoe, Ornamented with Feathers.
1074 Two Models of Ships.
1075 Limestone, in Yard Rotunda.

SANDHURST DIVISION.

[Sandhurst Court, East Side of Great Hall, next Mineral Collection.]

Class I.—Mineral Products.

SECTION 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Limes, Cements, Clays, Salt.*

1 ALABAMA COMPANY.—One Crystal.
2 BIRTH, THOMAS, *Huntly.*—One Case Auriferous Earth, Stones, &c.
3 CAMBRIDGE COMPANY, *Huntly.*—One Case Auriferous Earth, Stones, &c.
4 COOK, MR., *Back Creek.*—Roofing Slates.
5 CRAGO, WILLIAM, *Spring Gully, Sandhurst.*—Roofing Slates.
6 ELLIOTT, GEORGE, *Golden-square.*—One Case Specimens.
7 FREDERICK THE GREAT COMPANY.—Quartz Specimens.
7a LATHAM AND WATSON, *Sandhurst.*—Case of Gold and Specimens from their Claim, Hustler's Reef.
8 LOUGHBRIDGE, G., *Sandhurst.*—Collection of Pebbles and Stones.
9 LOWER HUNTLY DEEP LEAD COMPANY.—Case Auriferous Earth, Stones, &c.
10 MARCH REEF COMPANY.—Quartz Specimens.
11 M'PHERSON, LEWIS, *Sandhurst.*—One Case Quartz Specimens.
12 SMITH, A., *One-tree Hill, Sandhurst.*—Three Pieces Paving Stone.
13 TAYLOR, JAMES, *Mitchell-st., Sandhurst.*—One Piece Rough Granite; One Piece Polished Granite.

SECTION 3.—*Miscellaneous.*

14 WOLSTENCROFT, J. AND W.—Bricks, Brick Moulding, &c.

Class II.—Animal Products.

SECTION 5.—*Meat, Fish, Fowl, Whether Salted, Dried, Smoked, or Preserved; Gelatine, Isinglass, Milk, Butter, Cheese.*

15 TAYLOR, JOHN, *Epsom.*—Three Hams and two Sides of Bacon.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

SECTION 7.—*Cereals, Agricultural and Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

16 BRANDT, ERNEST, *High-st., Sandhurst.*—Patent Shingles.
17 HOLDSWORTH, JOHN, *Sandhurst.*—Colonial Gum Arabic; New Zealand Earth Gum; Beeswax; and White Seal Bottling Wax.
18 HOSKINS AND CO., *Huntly Steam Mills, Sandhurst.*—Slab of Blue Gum.
19 ROBBINS, JOHN, *Campaspe.*—Ten Cobs of Indian Corn and One Pumpkin.
20 MAGEE, ARTHUR.—One Spoke and One Felloe.
21 WALKER, G. F., AND CO., *Sandhurst.*—One Piece of Polished Blackwood and One Piece of Plain Blackwood.
22 WITCHIBBEE BROTHERS, *Axe Creek.*—Samples of Cotton.

SECTION 9.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

23 BRUCE, WILLIAM, *Eaglehawk.*—Porter, Cordials, and Vinegar.
24 BRUHN BROTHERS, *Axe Creek.*—One Dozen Colonial Wine.
25 COHN BROTHERS, *Sandhurst.*—One Hogshead Ale.
26 HEINE, A., *Axe Creek.*—Two Dozen Colonial Wine.
27 HEINE AND GREIFFENHAGEN, *Strathfieldsaye.*—Two Dozen of Wine.
28 HOLDSWORTH, J., *Sandhurst.*—Eau de Victoria.
29 KLEMM, F. C., *Sandhurst.*—One Dozen Colonial Wine.
30 THUNDER, A., *Sandhurst.*—Bottled Porter and Malt.
31 VLAMINCK BROTHERS, *Axe Creek.*—Two Cases Colonial Wine.
32 WINZER, WM., *Marong.*—One Dozen Colonial Wine.

SECTION 10.—*Miscellaneous.*

33 BRUCE, WILLIAM, *Eaglehawk.*—Sodawater; Lemonade; Gingerbeer.
34 HOLDSWORTH, J., *Pall Mall, Sandhurst.*—Sarsaparilla; Orange Quinine Wine.

Class IV.—Manufactures and the Useful Arts.

SECTION 11.—*Porcelain and Pottery, Glass, Iron and Hardware, Cutlery, Wickerwork.*

35 CONNELLY, T. J., *Sandhurst.*—Tinware and Brass Castings.
36 GUTHRIE, G. D., *Epsom.*—Pottery.
37 JONES, JOHN, *Sheepshead.*—Three Driving Picks.

SECTION 12.—*Leather and its Applications, Bonedust, Animal Charcoal and Oils, Blood, Ammonia, Glue, Fat, Stearine, Honey, Wax, Soap, Candles, Varnishes.*

37a BROMLEY, MR., *Sandhurst.*—Leather Picture Frame.
38 CASSIDY, JOHN, *Sandhurst.*—Boot without Seam.
38a GOUDGE AND SIBLEY, *Sandhurst.*—Collection of Leather, tanned and prepared at the Gum Creek, being ordinary samples, and not prepared especially for exhibition.
39 JONES, JOHN, *Deniliquin.*—One Case of Boots.

SECTION 14.—*Articles of Clothing; Lace, Embroidery, Specimens of Native Workmanship.*

40 M'MAHON, BRIDGET, *Huntly.*—Knitted Counterpane and Toilet Cover.
41 TESKEY, MISS, *Kangaroo Flat.*—Fancy-work Quilt.

SECTION 15.—*Miscellaneous.*

41a BAILES, J., *Sandhurst.*—Carved Clock Case.
42 FAUL, J. W., *Sandhurst.*—Self-acting Fountain.
43 HOLDSWORTH, J., *Sandhurst.*—Pick Handles.
44 REEVES, T., *California Gully.*—Four Pieces of New Description of Dovetail.

Class V.—The Ornamental Arts.

SECTION 16.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Engravings, Carvings.*

45 ADVANCE COMPANY, *Sandhurst.*—Model of Gold obtained from Claim.
46 BAILES, HENRY, *Sandhurst.*—Carvings.
47 BATCHELDER, B. P., *Sandhurst.*—One Photographic Lamp Shade.
48 EAGLEHAWK BOROUGH COUNCIL.—Photographs and Banner.
49 HUNTLY SHIRE COUNCIL.—Banner.

49a JOSEPH, R. E.—Stereoscopic, Cabinet, and Album Views of Victorian Scenery. Photographed by Exhibitor.
50 KILPING, MARY, *Sandhurst.*—Two Pictures.
51 KING, HENRY, *Sandhurst.*—Six Slabs—Specimens of Painting and Graining.
51a L'OSTE, MRS., *Sandhurst.*—Three Paintings—"The Gipsy," "The Children of the Sun," and the "Tooth-drawer."
52 MACKAY, A., *Sandhurst.*—One Oil Painting.
53 MARONG SHIRE COUNCIL.—Photographs and Banner.
54 RENSTRAW, CHARLES, *Sandhurst.*—Model of an Ironclad.
55 SANDHURST BOROUGH COUNCIL.—Photographs and Banner.
56 STUART, W. E. D., *Sandhurst.*—Two Paintings.
57 THUNDER, A., *Sandhurst.*—Three Pastel Drawings.
58 WELLS, A., *Sandhurst.*—Model of a Lifeboat.

SECTION 17.—*Plate, Jewellery, Working in Metals.*

59 M'NAMARA, JAMES, *Sandhurst.*—Pair of Silver Horse Shoes.

SECTION 18.—*Furniture and Decorations.*

60 KNIGHT, W., *Sandhurst.*—One Patent Lounging Chair. Made by H. Munzell.
61 SMETHURST, JOSEPH, *Sandhurst.*—Imitation Marble Mantelpiece.
62 WALKER, MRS. G. F., *Sandhurst.*—Cotton Reel Stand. Five Kinds of Wood.

SECTION 19.—*Printing, Stationery, and Bookbinding.*

63 ROBSHAW, J. K., *Sandhurst.*—One Case of Account Books; Samples of Bookbinding, Printing, &c.

Class VI.—Machinery.

SECTION 20.—*Architectural and Engineering Models and Drawings, Maps, Charts, Plans, and Sections.*

64 MUNZELL, H., *Sandhurst.*—Model Staircase.

SECTION 21.—*Miscellaneous.*

65 BAKEWELL, JOHN, *Golden Gully.*—One Gilt-framed Picture in Berlin Wool. By Mrs. Bakewell.
66 BROWN, GEORGE, *Sandhurst.*—One Frame of Gold Licenses.
67 GUNN, WILLIAM, *Kangaroo Flat.*—One Frame of Gold Licenses, &c.
68 LETHEBY, MRS., *Eaglehawk.*—One Leather Picture Frame.
69 SLOCOMBE, JOHN, *Sandhurst.*—Two Cases of Stuffed Australian Birds. Obtained in Sandhurst District.

SECTION 22.—*Motive Machinery and Carriages.*

70 JOSEPH AND CO., *Sandhurst.*—Silver Models of Machinery and Implements used in Gold Mining. Worked by Electro-motive Power. Manufactured by Exhibitor.
71 JOYCE, ALBERT, *Sandhurst.*—Working Model of Engine and Stampers.

SECTION 23.—*Mining, Metallurgical, Chemical, Philosophical, Surgical, Musical, Machinery and Instruments.*

72 JACKSON, WILLIAM B., *Golden Gully.*—Model of the Universal Circular and Incline Plane Motion Crushing Machine.
73 MEYERHOFF, CONRAD, *Sandhurst.*—Patent Quicksilver Copper Amalgamating Table; Model of Copper Amalgamating Tailings Machine; Model of Patent Quicksilver Puddler's Cradle; Two Surgical Instruments (Pro Capsis Uterial).
74 PARRY, DANIEL.—Stamper Gratings.

SECTION 24.—*Agricultural and Horticultural Machines and Implements.*

75 HOLMES, G. AND J., *Sandhurst.*—Patented Waggon for General Purposes.
76 MURRAY, JAMES, *Sandhurst.*—Wheat Separator.

OVENS AND MURRAY DIVISION.

[Ovens and Murray Court, adjoining the Sandhurst Court.]

Class I.—Mineral Products.

SECTION 1.—*Ores and Non-metallic Mineral Products, Geological, Specimens, Building Stones, Limes, Cements, Clays, Salt.*

1 BERRY, G. R., *Beechworth.*—Collection of Gems and Stones. From Reid's Creek, Woolshed, and Black Sand Creek.

2 BUSSELL, HENRY, *Sebastopol.*—Collection of Gems, Stones, Tin Ore, and Washdirt. From Woolshed, Sebastopol, and Eldorado.

3 CASTEAU, J. B., *Beechworth Gaol.*—Collection of Granites. From Beechworth' Chiltern, Barnawartha, and Yackandandah.

4 COMMITTEE, LOCAL, *Beechworth.*—Collection of Auriferous Quartz from Ovens district.

5 DUNN, EDWARD JOHN, *Beechworth.*—Collection of Tin Ores, Lignites, Gems, Precious Stones, Metallic Minerals, Granites, Shales, Slates, Sands, Clays, Pigments, and Crystals, in 7 cases. Collected in the Ovens district by Exhibitor.

6 FLETCHER AND DARVALL, *Pennyweight Flat.*—Collection of Clays, Sands, Kaolin, and Conglomerate. From Fletcher's Claim.

7 GANNELL, EDWIN, *Reid's Creek.*—Tin Ore, Smelted Tin, Gems and Stones. From Reid's Creek and Black Sand Creek.

8 GAUNT, WILLIAM HENRY, *Beechworth.*—Specimens of Molybdenite. From Yackandandah.

9 HEDLEY, JOHNSON, *Sebastopol.*—Collection of Washdirt, Gems, Crystals, Stones, Tin Ore, and Gold. From Woolshed and Sebastopol.

10 LION GOLD MINING COMPANY, *Benalla.*—Specimens of Auriferous Quartz. From their reef at Benalla.

11 MONGAN, ANTHONY, *Clear Creek.*—Samples of Variegated Slates. From Kenchington Creek.

12 PEAK, C., *Chiltern.*—Samples of Tin Ore, Gems, Stones, and Crucibles. From Chiltern.

13 RUTHERGLEN BOROUGH COUNCIL.—Collection of Washdirt and Tailings. From Rutherglen.

14 STEPHEN, GEORGE MILNER, F.R.S., *&c.*, *Beechworth.*—Four Cases containing Diamonds, Sapphires, Topazes, Hyacinth, Garnets, Barklyite, Rubies, Spinelles of all varieties, Gold Crystals, Gold in Granite, Gold in Sandstone, Tourmalines, Cornelians, &c. Collected by Exhibitor.

15 STEVENS, JOHN, *Beechworth.*—Samples of Beechworth Slates, Mansfield Lime and Lime Putty.

16 TURNER, WILLIAM JAMIESON, *Beechworth*—Collection of Auriferous Quartz, Tin Ore, Gems and Precious Stones. From the Ovens district.

17 TURNER, WILLIAM JAMIESON, *Beechworth.*—Ovens Gems, cut and set.

18 WITT, WILLIAM, *Beechworth.*—Lignites. From Eldorado.

Class II.—Animal Products.

SECTION 4.—*Wool, Hair, Skins, Furs, Silk, Feathers, Horns, Hoofs, Bones, Guano.*

19 BARRETT, ROBERT, *Chiltern.*—Sample of Indigenous Silk. From Chiltern.

20 FIRTH, R. H.—Sample of Bone Dust. Manufactured by Exhibitor.

21 MELROSE, JOHN, *Beechworth.*—Curled Horsehair. Manufactured by Exhibitor.

22 RUTHERGLEN BOROUGH COUNCIL, *Rutherglen.*—Sample of indigenous Silk. From Rutherglen.

SECTION 5.—*Meat, Fish, Fowl, whether Salted, Dried, Smoked, or Preserved; Gelatine, Isinglass, Milk, Butter, Cheese.*

23 CONNEBBIE, JOHN, *Beechworth.*—Samples of Smoked Bacon and Ham. Cured by Exhibitor.

SECTION 6.—*Miscellaneous.*

24 DUNN, EDWARD JOHN, *Beechworth.*—Collection of Victorian Reptiles, Fish, &c. Collected by Exhibitor, chiefly on the Ovens.
25 EUSTACE, ALBERT WILLIAM, *Eldorado Farm, Chiltern.*—Opossum and Case.
26 RAMSEY, PETER D., *Beechworth.*—Case of Ovens Birds.
27 RUTHERGLEN BOROUGH COUNCIL, *Rutherglen.*—Pelican, shot at Lake Moodemere.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

SECTION 7.—*Cereals, Agricultural and Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

28 BOVERY AND BARNES, *Corowa, Murray.*—Specimens of Murray Pine.
29 BROWN, G., *Wahgunyah.*—Samples of Ovens-grown New Orleans Cotton.
30 DUITCHMAN, JOSEPH, *Beechworth.*—Samples of Ovens Timber.
31 GARDINER, JEFFERY, *Holmes's-creek, Beechworth.*—Sample of Canary Seed. Grown by Exhibitor.
32 GRAHAM AND WILSON, *Beechworth.*—Samples of Wheat. Grown by the Exhibitors.
33 GRIMMOND, DAVID, *Wahgunyah.*—Samples of Sea Island and New Orleans Cotton. Grown on the Ovens.
34 HENLEY, JAMES, *Oxley Plains, Ovens.*—Samples of manufactured and unmanufactured Tobacco. Grown and manufactured by the Exhibitor.
35 HOWARD, REV. WILLIAM CORBET, *Beechworth.*—Section of Tree Fern.
36 MORRES, H., *Beechworth.*—Specimens of Timber. Grown on the Little River.
37 NEWTON, JOSEPH, *Chiltern-road, Ovens.*—Specimens of Black Wattle and Bark.
38 PYKE, MR., *Barnawartha Flour Mills.*—Sample of Wheat.
39 REID, C. A., *Reidsdale, Ovens.*—Red Lammas Wheat. Grown by Exhibitor.
40 REID, CURTIS A., *Reidsdale, Ovens.*—Specimens of Almond Tree and Hickory.
41 RITCHIE AND HEDLEY, *Eldorado.*—Sample of Oats. Grown by Exhibitors.
42 RUTHERGLEN BOROUGH COUNCIL, *Rutherglen.*—Specimens of Murray Pine.
43 SAYERS, BENJAMIN, *Beechworth Flour Mills.*—Samples of Wheat.
44 SLATER, ALVERA, *Beechworth.*—Collection of Ovens Timbers.
45 STEPHEN, GEORGE MILNER, F.R.S., *Beechworth.*—Specimen of Murray Pine.
46 TIDYMAN, C., *Beechworth.*—Samples of Sassafras Bark. Grown on the Ovens.

SECTION 8.—*Flour and Meal, of every Variety and in every Form; Malt, Starch, Gluten, Sago, Tapioca, Arrowroot, Sugar, Confectionery.*

47 CHAFFER, JAMES, *Indigo-creek, Barnawartha.*—Sample of Flour.
48 EDWARDS, HENRY, *Ovens Brewery, Beechworth.*—Sample of Malt. Made by Exhibitor.
49 LLOYD, CHARLES.—One Case of Yeast Powder. Manufactured by Exhibitor.
50 PYKE, MR., *Barnawartha Flour Mills.*—Sample of Flour.
51 SAYERS, BENJAMIN, *Beechworth Flour Mills.*—Sample of Flour.

SECTION 9.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

52 CHAFFER, JAMES, *Indigo-creek, Barnawartha.*—Samples of Dried Figs, Raisins, Peaches, and Almonds.
53 CHAFFER, JAMES, *Indigo-creek, Barnawartha.*—Sample of Tomato Sauce and Wine Vinegar. Made by Exhibitor.
54 CHEESELY, JAMES, *Indigo-creek, Barnawartha.*—Sample of Dried Peaches.
55 DUNN, E. H., *Beechworth.*—Assortment of Jams. Made by the Exhibitor from fruits grown in Beechworth.
56 DUNN, E. H., *Beechworth.*—Samples of Vegetable Sauce and Catsup. Made by Exhibitor.

57 HATTERSLEY, JOHN, *Yackandandah.*—Soda Water. Made by Exhibitor.

58 PEAK, E. P., *Chiltern.*—Samples of Vegetable Sauce and Catsup. Made by Exhibitor.

59 PEAK, E. P., *Chiltern.*—Assortment of Jams. Made by the Exhibitor from fruits grown at or near Chiltern.

60 POOLEY, HUMPHREY, *Indigo-creek, Barnawartha.*—Samples of Dried Apples, Peaches, Nectarines, and Raisins.

61 RAY AND THORP, *Mount Prior Vineyard, Gooramadda.*—Samples of Reisling Vintage, 1864; Brown Muscatel Vintage, 1864; Reisling Vintage, 1865.

62 REAU, CAMILLE, *Wahgunyah.*—Samples of Corowa Vineyard Wine, consisting of Tokay and Malbac, Vintage 1865.

63 REID, CURTIS A., *Reidesdale, Ovens.*—Wine produced from various Grapes.

64 REID, CURTIS A., *Reidesdale, Ovens.*—Sultana Almonds, and Seedlings from Sultana Almonds. Grown by Exhibitor.

65 RICHMOND, JOHN, *Beechworth.*—Sample of Claret Wine. Made by Exhibitor.

66 RUSSOM, EDWARD SAMUEL, *Beechworth.*—Soda Water, Lemonade, and Sarsaparilla. Manufactured by Exhibitor.

67 WATSON, SYDNEY, *Walwa, Upper Murray.*—Sample of Zante Currants. Grown by Exhibitor.

Class IV.—Manufactures and the Useful Arts.

SECTION 12.—*Leather and its Applications, Bonedust, Animal Charcoal and Oils, Blood, Ammonia, Glue, Fat, Tallow, Stearine, Honey, Wax, Soap, Candles, Varnishes.*

68 DUNN, E. H., *Beechworth.*—Virgin and Common Beeswax. Produced at Beechworth.

69 HEWITT, JOHN T., *Soap Manufacturer, Beechworth.*—Soap. Made by Exhibitor.

SECTION 13.—*Fabrics in Silk, Wool, Cotton, Hair, Flax, Hemp, Thread, Straw—Spun, Woven, Felted, or Laid—Plain or Mixed.*

70 BEECHWORTH BOROUGH COUNCIL, *Ovens.*—Silk Banner, with Emblems.

71 BEECHWORTH SHIRE COUNCIL, *Ovens.*—Silk Banner, with Emblems.

SECTION 14.—*Articles of Clothing; Lace, Embroidery, Specimens of Native Workmanship.*

72 BANFIELD, E. B., *Benalla.*—Crochet Work, accompanied with a Letter. Executed by Exhibitor, an Aboriginal Half-caste.

73 DUNN, E. J., *Beechworth.*—Collection of Native Tomahawks and Utensils. Collected by Exhibitor.

SECTION 15.—*Miscellaneous.*

74 EDWARDS, HENRY.—Two Casks. Made by Exhibitor from indigenous Timber (Messmate). The same kind of casks have been in constant use for the last two years, and found well suited to the climate and easily cleaned.

75 SWAIN, W.—Brooms. Made by Exhibitor, from Grass and Tea Tree.

Class V.—The Ornamental Arts.

SECTION 16.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Engravings, Carvings.*

76 BOROUGH COUNCIL OF BEECHWORTH, *Ovens.*—Photographic Views and Statistics.

77 BOROUGH COUNCIL OF RUTHERGLEN, *Ovens.*—Photographic Views and Statistics.

78 DUNCAN, WILLIAM, *Beechworth.*—Specimen of Sign Writing.

79 HULME, EDWARD, *Stanley.*—Oil Painting, "Australian Flowers." Painted by Exhibitor.

80 LOCAL COMMITTEE, *Beechworth, Ovens.*—Certificate of Merit. Designed by Mr. Hulme, Stanley.
81 RANSOME, ROBERT, *Beechworth.*—Oil Painting—"Maid at the Well." Painted by John Anderson.
82 SHEPHARD, ALBERT K., *Beechworth.*—Oil Painting—"Murray River Scene." Painted by Eustace.
83 SHIRE COUNCIL OF BEECHWORTH, *Ovens.*—Photographic Views and Statistics.
84 SOULBY, W. T., *Beechworth.*—Oil Painting—" Sir John Falstaff," by John Anderson; and Photographic View of "Lake Kerferd."

SECTION 20.—*Architectural and Engineering Models and Drawings, Maps, Charts, Plans, and Sections.*

85 CUZNER, JOHN HENRY, *Beechworth.*—Maps drawn at the Beechworth Grammar School. Exhibited as Specimens of Scholars' Mapping.
86 CUZNER, JOHN HY.—Educational Diagram, for use of Infant Schools. By Exhibitor.
87 MORRIS, E. R.—Specimens of Mapping and Ornamental Writing. Executed by Exhibitor.

Class VI.—Machinery.

SECTION 23.—*Mining, Metallurgical, Chemical, Philosophical, Surgical, Musical, Machinery and Instruments.*

88 CUZNER, JOHN HENRY, *Beechworth.*—Altiscope for Demonstrating to Scholars the Cause of Long-continued Days and Nights within the Polar Circles, the Sun's Meridian Altitude, Zenith Distance, and other facts in Astronomical Geography.
89 CUZNER, JOHN HENRY, *Beechworth.*—Geographical Clock, for showing the Relative Time and Difference of Time between any given places.

SECTION 26.—*Miscellaneous.*

90 ATKINSON, CORRELL AND CO., *Beechworth.*—Nave, Felloes, and Spokes, made of indigenous Timber. Grown on the Ovens.
91 BISHOP, JOSEPH E., *Newtown, Beechworth.*—Wheel. Made by Exhibitor of various kinds of indigenous Timber, grown on the Ovens.
92 CLARKE, R., *Beechworth.*—Multiple Mortice Gauge. Invented by Exhibitor.
93 HOSKINS, S. H., *Beechworth.*—Hand-punched Grating for Quartz Mills. Executed by Exhibitor.
94 MARTIN, P. J., *Beechworth.*—Perfumery Still. Made by hand by Exhibitor.
95 M'CABE, ARTHUR R.—Two Models of Safety Hooks, One Safety Stirrup Iron, and improved Tailor's Shears. All invented and made by Exhibitor.
96 TAYLOR, SAMUEL, *Beechworth.*—Expanding Horse Shoes, invented by Exhibitor; Racing Plate and Horse Slipper, made by Exhibitor.
97 WALTERS, EDMOND, *Beechworth.*—Improved Blast Fan. Made by Exhibitor.
98 WILLIAMSON, WILLIAM, *Beechworth.*—Three Sets of Horse Shoes, various kinds. Made by Exhibitor.

WANGARATTA DIVISION.

[Wangaratta Court, adjoining the Ovens and Murray Court.]

Class I.—Mineral Products.

SECTION 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Limes, Cements, Clays, Salt.*

1 LARKINGS, THOS., *Wangaratta.*—One Piece Pipeclay, containing Chalk.
2 LOCAL EXHIBITION COMMITTEE.—One Block White Granite; One Block Blue Granite; One Block Granitic Freestone; Four Pieces Silicious Limestone; One Piece Limestone (Winton); One Piece Limestone (Wangaratta); One Piece Limestone (Mansfield).
3 MORRIS AND ROMERO, *Wangaratta.*—One Piece Fire Clay.

Class II.—Animal Products.

SECTION 4.—*Wool, Hair, Skins, Furs, Silk, Feathers, Horns, Hoofs, Bones, Guano.*

4 DOCKER, F. G., *Wangaratta.*—One Fleece Rambouillet Wool.
5 KAY, T. D., *Tarrawingee.*—Two Skins Long-wool Sheep.
6 REID, C. A., *Tarrawingee.*—One Fleece Merino Wool; One Fleece Hampshire Down Wool.
8 RUTHERFORD, G., *Wangaratta.*—One Pair Ram's Horns (Ram 29 years old).
7 RUTHERFORD, JOHN, *Yarrawonga.*—Three Fleeces Merino Wool.
9 SIMSON, H. N., *Benalla.*—One Fleece Merino Wool.
10 TELFORD, G., *Yarrawonga.*—One Fleece Merino Wool.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

SECTION 7.—*Cereals, Agricultural and Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

11 BEVAN, T., *Wangaratta.*—One Slab Red Gum.
12 CHANDLER, C., *Wangaratta.*—One Bag Potato Oats.
13 CHANDLER, C., *Wangaratta.*—One Bag Californian Wheat.
14 CHANDLER, JAS., *Wahgunyah.*—One Bag American Goldamit Wheat
15 DOCKER, F. G., *Wangaratta.*—One Bag Californian Wheat.
16 DOCKER, F. G., *Wangaratta.*—One Slab She-oak; One Cross Section She-oak; One Slab Stringy Bark; One Piece Myall (Full-size Tree); One Piece Myall (Polished).
17 EVANS, D. H., AND CO., *Wangaratta.*—One Bag American Goldsmit Wheat; One Bag White Tuscan Wheat.
18 HENLEY, JAS., *Oxley.*—One Box Tobacco (Aromatic Twist); One Box Tobacco (Cable Twist); One Box Tobacco (Small Plug); One Box Tobacco (Large Plug); One Box Tobacco (Unmanufactured).
19 LOCAL EXHIBITION COMMITTEE.—One Slab Stringy Bark; One Slab White Box.
20 MOORE, J., *Wangaratta.*—One Bag Californian Wheat.
21 PARFITT, H. S., *Wangaratta.*—One Bag Potato Oats; One Bag Tartarian Oats.
22 SPINK, GEORGE, *Tarrawingee.*—One Bag Potato Oats.
23 SPINK, GEORGE, *Tarrawingee.*—One Bag English Barley.
24 SUMMERS, J. C., *Wangaratta.*—One Slab Red Gum; One Slab Ironbark; One Slab Murray Pine.
25 VINCENT, R. B., *Laceby.*—One Bag Cape Barley.

SECTION 8.—*Flour and Meal, of every Variety and in every Form; Malt, Starch, Gluten, Sago, Tapioca, Arrowroot, Sugar, Confectionery.*

26 ALLAN AND BALDRY, *Wangaratta.*—One Bag Flour, No. 1; One Bag Flour, No. 2.
27 EVANS, D. H., AND CO., *Wangaratta.*—One Bag Flour.
28 RYAN, T., *Wangaratta.*—One Bag Flour.

SECTION 9.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles; Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

29 DOCKER, F. G., *Wangaratta.*—Five Bottles Vinegar; Two Bottles Olive Oil.
30 DOCKER, F. G., *Wangaratta.*—Twelve Bottles Malbec Wine.
31 M'DONALD, W., *Wangaratta.*—Six Bottles Brandy.
32 SPINK, G., *Tarrawingee.*—Six Bottles Shiraz Wine.
33 SPINK, G., *Tarrawingee.*—One Box Raisins.

Class IV.—Manufactures and the Useful Arts.

SECTION 12.—*Leather and its Applications, Bonedust, Animal Charcoal and Oils, Blood, Ammonia, Glue, Fat, Tallow, Stearine, Honey, Wax, Soap, Candles, Varnishes.*

34 BOYD AND LEISHMAN, *Wangaratta.*—One Box Glue.

SECTION 15.—*Miscellaneous.*

35 DOCKER, F. G., *Wangaratta.*—One Cask made of Mountain Ash.

Class V.—The Ornamental Arts.

SECTION 16.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Engravings, Carvings.*

36 DOCKER, F. G., *Wangaratta.*—Two Photographs—"Bontherambo." Photographed by A. Hall.

37 WANGARATTA BOROUGH COUNCIL.—One Case Photographs of the Borough of Wangaratta (Photographed by A. Hall); Two Banners; Coat of Arms.

VICTORIAN DEPARTMENT.

ADDENDA.

Class I.—Mineral Products.

SECTION 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Limes, Cements, Clays, Salt.*

1 Bolan and Co., Yackandandah Reef.—6 cwts. Quartz, averaging 3750 ozs. per ton.

2 Eldorado Company, Gaffney's Creek.—Auriferous Quartz Specimens.

3 Huxley and Parker, Russell-st.—Marbles from Calliope River, Port Curtis. Cut and polished by the Exhibitors.

4 James, Edward, Ballarat.—Sample of Roofing Slates, from the Penrhyn Quarries, Smeaton.

5 Lyons and Co.—Quartz Specimens from Royal Standard, Black River.

6 Macarthur, J. C., Gaffney's Creek.—Auriferous Quartz Specimens.

7 Morrison, Charles.—Quartz and Mundic.

8 Royal Standard Gold Mining and Crushing Company, Woodspoint.—Large block of Auriferous Quartz, and Statistics of the Company.

9 Shakespeare, Mr., Gaffney's Creek.—Auriferous Quartz Specimens.

10 Selwyn, A. R. C., Geological Survey.—Geological Specimens.

11 Thompson, G. W., 3 Little Collins-st. W.—Gold, Silver, and Copper Ores, from the mines of South Australia and New South Wales.

Class II.—Animal Products.

SECTION 4.—*Wool, Hair, Skins, Furs, Silk, Feathers, Horns, Hoofs, Bones, Guano.*

Cuningham and Macredie (Per).—

12 MacKnight and Irving.—Fleece of Wool. Bred by Exhibitors.

13 Degraves and Co.—Fleece of Wool. Bred by Exhibitors.

14 Ducrow, L. J., Melbourne.—Samples of Improved Wools.

15 Gulliver, Mrs.—Sample of Raw Silk.
16 Goldsbrough, R., and Co., Melbourne.—Five Samples of Wool.
17 George, J., Brunswick.—Fossil Bone.
Shire Council of Hampden.—
18 Dowling, Thomas, Darlington.—Sheep's Fleece. Bred by Exhibitor.
19 Shaw, Thomas, Wooriwyrite.—Sheep's Fleece. Bred by Exhibitor.
20 Cumming, John, Terinallum.—Sheep's Fleece. Bred by Exhibitor.
21 Cumming, John, Terinallum.—Sheep's Fleece. Bred by Exhibitor.
22 Cumming, John, Terinallum.—Lamb's Fleece. Bred by Exhibitor.
23 Cumming, John, Terinallum.—Sheep's Fleece. Bred by Exhibitor.
Shire Council of Hampden (Per).—
24 Cumming, John.—Four Fleeces of Wool. Bred by Exhibitor.
25 Shaw, Thomas.—Fleece of Wool. Bred by Exhibitor.
26 Dowling, Thomas.—Fleece of Wool. Bred by Exhibitor.

SECTION 6.—*Miscellaneous.*

27 Ogden, Robert, Snake Charmer.—Elephant's Tooth and Ceylon Umbrella.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

SECTION 7.—*Cereals, Agricultural and Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

28 Bergicourt, M., Mauritius.—Samples of Tobacco, Cigars, Cigarettes, and Snuff. Manufactured by the Exhibitor.
29 Clarke, Mr., Bullarook Border Saw Mills.—Plank of Timber (Messmate).
30 Leslie, A., Agent, Melbourne.—Seed Wheat, grown at Rockhampton, Queensland.
31 Newbury, J. Cosmo, Geological Survey Department.—A case of Paper-making Materials, and the Residual Products.

SECTION 9.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

32 Felton, Alfred, Melbourne.—Felton's Patent Improved Chlorodyne and Sarsaparillas.
33 Hopwood, Mrs. H., Echuca.—Case of Wine.
34 Henderson, W., and Co., 95 Swanston-st.—Old Tom Gin. Manufactured by Exhibitors.
35 Levy, John, and Sons, Footscray.—Samples of Spirit distilled from Sugar Beet.
36 Tracey, Martin, Geelong.—Two Hogsheads of Ale. By Exhibitor.

Class IV.—Manufactures and the Useful Arts.

SECTION 11.—*Porcelain and Pottery, Glass, Iron and Hardware, Cutlery, Wickerwork.*

37 Cawkwell, H. A., High-st., Malvern.—Drain Pipes, Bricks, and Pottery, in Terra Cotta.
38 Day, John, South Yarra.—Pier Glass and Frame. The frame designed and executed by Mrs. Trecker.
39 Emery, Brothers, Collingwood.—Samples of Pottery.
40 Henderson, David, Campbell-st., Collingwood.—Babies' Chairs. Designed and manufactured by Exhibitor.

SECTION 12.—*Leather and its Applications, Bonedust, Animal Charcoal and Oils, Blood, Ammonia, Glue, Fat, Tallow, Stearine, Honey, Wax, Soap, Candles, Varnishes.*

41 Alston, David, 25 Bourke-st. W.—Cart Harness.
42 Reynolds, E., Maldon.—Samples of Glue.
43 Scott, Samuel, Campbell's Creek.—Sample of Leather. Manufactured by the Exhibitor.
44 Willis, W., Wangaratta.—Saddle. Made by Exhibitor.

SECTION 13.—*Fabrics in Silk, Wool, Cotton, Hair, Flax, Hemp, Thread, Straw—Spun, Woven, Felted, or Laid—Plain or Mixed.*

45 Brown, Walter, 67 Chancery-lane.—Produce, Bullion, and Seamless Bags. By the Exhibitor.
46 Collins, Mrs. T., Williamstown.—Crochet Quilt.
47 Dickson, Miss, Upper Hawthorn.—Tatting Lace.
48 Johnstone, David, St. Kilda.—Two Wool Pictures—"Jacob Blessing his Children" and "Tobit the Angel."
49 Robertson, John, 89 Lonsdale-st. E.—Carriage Mats. Dyed by Exhibitor.
50 Swan, Mrs. H., 125 Faraday-st., Carlton.—Wool-work Knitting—Caps and Socks.
51 Timbrell, Ann, Princes-st., Petrie-terrace, Brisbane.—Twenty Boxes of Queensland Silk, one Box of Melbourne Silk.

SECTION 14.—*Articles of Clothing; Lace, Embroidery, Specimens of Native Workmanship.*

52 Allen, Mrs., Mechanics' Institute, Prahran.—Specimens of Lace and Edging.

SECTION 15.—*Miscellaneous.*

53 Aitken, C. A., Hotham.—Acquarium.
54 Bannister, R. D., Geelong.—Two Models of Boats.
55 Elliott, S., Brighton.—One Tin Preserved Meat and Vegetables—"Irish Stew." Manufactured by the Exhibitor, in New South Wales, in the year 1847. Now 20 years old.
56 Francis, Captain.—Cable.
57 Gribbon, Mrs.—A Cross, ornamented with Leather-work.
58 Morton, Lockhart, Melbourne.—Model for Loading Railway Trucks with Sheep.
59 Roy, Charles, Emerald Hill.—Model of Mantelpiece.
60 Sheath Brothers.—Patent Self-supplying Water Brushes.
61 Schwab, N., 7 Wyland-lane, Lonsdale-st.—Mechanical Contrivance for Disconnecting Horse from Carriage.
62 Trotman, Sanders, London.—Patent Self-extinguishing Safety Lamp. Imported.
63 White, W. and G., Williamstown.—Lifeboat. Built by Exhibitors.

Class V.—The Ornamental Arts.

SECTION 16.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Engravings, Carvings.*

64 Atyeo, Frederick, Carlton.—Church Font. Designed by Exhibitor.
65 Avoca Shire Council.—Photographic View of Avoca.
66 Griffith, Mr., Geelong.—Two Marble Figures, Pomona and Flora. For Sale.
67 King, J., Ballarat.—One Water-colour Drawing.
68 Norman, W. J., 170 Elizabeth-st.—Needle Work and Water-colour Drawing.
69 Teale, Goodman, Melbourne.—Large Cameo.

SECTION 19.—*Printing, Stationery, and Bookbinding.*

70 Dunolly Borough Council.—Two Framed Copies of *Dunolly and Bet-Bet Shire Express*—one containing an account of Dunolly, the other an account of the district. G. Pettifer and Co.
71 Fussell, James, 25 Elizabeth-st.—Squatting Directory of New South Wales.

72 Kerr, W. R. M., *Advertiser* Office, Castlemaine.—*Castlemaine Advertiser*, printed in colonial gold leaf. It bears the Castlemaine Corporative Seal, and is the first paper of the kind got up in the Colonies; contains an Account of the Rise and Progress of the Municipality, Public Buildings, &c.

73 Sinclair, James, Fitzroy Gardens.—Agricultural, Horticultural, Philosophical, and Poetical Works. By the Exhibitor.

SECTION 20.—*Architectural and Engineering Models and Drawings, Maps, Charts, Plans, and Sections.*

74 Fussell, James, 25 Elizabeth-st.—Chart of the World. By Justus Perthes.

SECTION 21.—*Miscellaneous.*

75 Hall, William.—Relic from the Fire at the Tower of London, 1842.
76 M'Carthey, G., Railway Traffic Superintendent.—Collection of Ancient Coins.
77 Wilkie, Mrs.—Picture of Seaweed and Cases of Seaweed.

Class VI.—Machinery.

SECTION 22.—*Motive Machinery and Carriages.*

78 Ricketts, William, Richmond.—Perambulator, Buggy Perambulator. Manufactured by Exhibitor.

SECTION 23.—*Mining, Metallurgical, Chemical, Philosophical, Surgical, Musical, Machinery and Instruments.*

79 Barratt and Costin, Ballarat.—Panning-out Motive Cradle. Provisionally registered by Exhibitors.

80 Ellery, R. L. J., Government Astronomer.—Group of Instruments used in the Geodetic Survey.

81 Wright, William, 100, 101, and 102 Little Bourke-st. W.—Small Centrifugal Pump, delivering 100 gallons of water per minute, one-horse power; showing its capabilities and usefulness for brewers, ships, graving docks, &c., from the impossibility of choking, owing to the absence of valves. Made by Exhibitor.

SECTION 25.—*Naval, Military and Engineering, Civil Engineering, Architectural, and Building Contrivances.*

82 Egan, Michael, Jun., Richmond.—Self-supporting Arch.
83 Woodward, Frederick James.—Portable Tank Closet.

SECTION 26.—*Miscellaneous.*

84 Mayne, John.—Model of Water-lifting Machine.
85 Newhouse, T., 163 Bourke-st. W.—Mowing, Reaping, and Chaff Knives.
86 Toft, J.P.—Model of Wool Press.

NETHERLANDS-INDIA.

[Netherlands-India Court, West Side of Great Hall, by Entrance to the Rotunda.]

1 MORGAN, MELBOURNE AND CO., *Batavia.*—1 bottle Cardamoms; 1 bottle Nutmegs, "Bogor;" 1 bottle Nutmegs, ord.; 1 bottle Mace, "Bogor;" 1 bottle Mace, ord.; 1 bottle Black Pepper; 1 bottle White Pepper; 1 bottle Long Pepper; 1 bottle Cloves; 13 bottles Batavia Rice; 5 bottles Sourabaya Rice; 1 bottle Java Coffee; 1 bottle Mametyes Coffee; 1 bottle W. J. P. Coffee; 1 bottle Padang Coffee; 1 bottle

Gambier Riouw; 1 bottle Betelnuts; samples of various qualities of Gutta-percha, India-rubber, Gum Benjamin, Cassia, Teak-wood, Japan-wood, Kadrang-wood, Mother-o'-Pearl, Tortoise-shells, Genractoe Rope, and Genractoe Fibre (used for manufacture of Rope, and mixed with horse-hair in stuffing upholstery, &c.

2 MORGAN, MELBOURNE AND CO., *Batavia.*—1 bottle Sago Flour; 1 bottle Sago Pearl; 1 bottle Kadgang Oil; 1 bottle Cocoa Oil; 1 bottle Tamarinds; 1 bottle Cubebes; 1 bottle Damar.

3 MORGAN, MELBOURNE AND CO., *Batavia.*—Samples:—1—Coffee, crop of 1862, Preanger; 2—Coffee, crop of 1863, Preanger; 3—Coffee, crop of 1864, Preanger; 4—Coffee, crop of 1865, Preanger; 4—Coffee, crop of 1866, Preanger; 6—Sugar (yellow muscovados), Sugar Mill, Hono Pringo, Pekalongan; 7—Sugar (brown muscovados), Sugar Mill, Hono Pringo, Pekalongan; 7*a*—Sugar (white), Sugar Mill, Hono Pringo, Pekalongan; 8—Sugar (white), Sugar Mill, Tjipiring, Samarang; 9—Rice, first quality, Batavia; 10—Rice, second quality, Batavia; 11—Rice, third quality, low to fair, Batavia; 12—Rice, dressed, Indramayoe; 13—Tobacco, Kedirie; 14—Indigo, Djokjokarta; 15—Nutmegs, first quality, Banda; 16—Nutmegs, second quality, Banda; 17—Nutmegs, third quality, Banda; 18—Mace, first quality, Banda; 19—Mace, second quality, Banda; 20—Mace, third quality, Banda; 21—Cloves, Amboina; 22—Black Pepper, Padang; 23—White Pepper, Padang; 24—Nutmeg Soap, Banda; 25—Cinnamon, Bagelen; 26—Gambier, Riouw; 27—Gutta Percha, Borneo; 28—Gum Damar, Palembang; 29—Gum Damar, Benkoelen; 30—Gum Benjamin, Palembang; 31—Arrowroot, Kedirie; 32—Sago, Kedirie; 33—Flour (from the Yellow Katella), Kedirie; 34—Flour (from the Sweet Cassava), Kedirie; 35—Flour (from the Temoe Iring), Kedirie; 36—Flour (from the Bark of the Aren Palm-tree), Kedirie; 37—Cassava, Kedirie; 38—Buckwheat, Preanger; 39—Rattans, Banjermassing; 40—Koesa (very fit for light cordage; is used for horse and fish lines), Timor; 41—Banoenae (very fit for light cordage; is used for horse and fish lines), Timor; 42—Noenae (very fit for light cordage; is used for horse and fish lines), Timor; 43—Kanoenak or Koekbaie (is used for light cordage), Timor; 44—Bonne or Goemaetoe (fit for ties and cable cord), Timor; 45—Baa (is used for light cordage and cable cord), Timor; 46—Toea or Vepak (fit for bridles, untwisted it is used for ties), Timor; 47—Toene (is used for light cordages on native crafts, untwisted it serves for ties), Timor; 48—Kapas (for light cordage and fish lines), Timor; 49—Kolang Soesoe (much required for ties for fish nets), Timor; 50—Silk (white), Krawang; 51—Silk (yellow), Krawang; 52—Silk (white), Menado; 53—Silk (yellow), Menado; 54—Sawuko-mo (of which clothes can be made), Menado; 55—Roots of the Baliasse-tree yielding a yellow paint for dyeing cotton), Cheribou; 56—Yellow Chalk (fit for yellow paint when it is ground, and for red paint when it is burned, washed out, and dried; and is moreover used for preparing vitriol and alum), Soerabaia; 57—Red Paint (made from yellow chalk), Soerabaia; 58—Gypse, first quality, Soerabaia; 59—Gypse, second quality, Soerabaia; 60—Beeswax, Timor; 61—Unrefined Petroleum, Tagal; 62—Refined Petroleum, Soerabaia; 63—Unrefined Petroleum, first quality, Palembang; 64—Unrefined Petroleum, second quality, Palembang; 65—Lagan Oil, Benkoelen; 66—Palm Oil, Banjoemaas; 66*a*—Palm Oil, Banjoemaas; 67—Oil of the Sindor-tree, Banjermassing; 68—Oil of Kepok Kernels, Japara; 69—Oil of the Guinea Palm-tree, Preanger; 70—Essence of Geranium, Preanger; 71—Wedgen Oil of the Djoema Palm-tree, Soerakarta; 72—Wood Oil, Kedirie; 73—Harioeng Oil, Kedirie; 74—Cacaonut Oil, Batavia; 75—Kaloewah Oil, Soerakarta; 76—Kepoeh Djankong Oil, Soerakarta; 77—Cocoanut Oil, No. 2, Batavia; 78—Cocoanut Oil, No. 2, Batavia; 79—Oil, from the Fruit of the Kamala Kyan-tree, Preanger; 80—Indigo, Djokjokarta; 81—Tin, Billiton; 82—Tea (Souchon), Preanger.

[These Exhibits are on the Western side of the Great Hall, and adjoining the South Australian Court.]

NEW SOUTH WALES COURT.

[New South Wales Court, West Side of Great Hall, adjoining the Queensland Court.]

Class I.—Mineral Products.

Section 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Limes, Cements, Clays, Salt.*

1 Avery, Alderman S., *Grafton*.—Coal, Coaldale, Clarence River. From the surface, not worked, and extent unknown.

2 Bawden, Mr. T., J.P., *Mayor of Grafton*.—Antimony Ore (Sulphuret), Clarence River.

3 Bawden, Mr. T., J.P., *Mayor of Grafton*.—Coal (waterworn), Richmond River.

4 Boesen, T. A., *Sydney*.—Sample of Petrified Wood from Murrurundi.

5 Cadiangullong Consolidated Copper Mining Company (Limited), *N.S.W.*—Specimens of Copper Ore.

5a Clarke, Rev. W. B., *Sydney*.—Collection of Specimens from the Wianamatta and Hawkesbury Rocks, overlying the productive Upper Coal Measures of New South Wales, and exhibiting the proper stratigraphical position of the Palæozoic Fishes discovered by the Rev. W. B. Clarke. These specimens exhibit the true descending successional order of the strata from the top of the Wianamatta beds to the bottom of the upper division of the Hawkesbury rocks, through two succeeding sections (combined, of 1000 feet of vertical thickness, and representing an area of 1000 square miles, including elevations of from 3450 feet above the sea to 16 feet below it). Where additional specimens are necessary, reference is to be made to photographic and lithographic figures exhibited on four plates, to a printed series of sections, and to an essay on *Transmutation of Rocks*, by the exhibitor. Contained in three cases.

6 Clements, John F., *Summer-hill, near Bathurst*.—Specimen of Soapstone; Specimen of Firebrick Clay; Specimen of Limestone. All from the Bathurst District.

7 Colonial Architect, *N.S.W.*—Specimens of Building Stones, viz.:—Sydney Sandstone; Pyrmont Stone; Maitland, Morpeth, and Newcastle Freestones; Specimens of Bricks, &c.

8 Fawcett, Mr. C. H., J.P. *and* P.M., *Casino*.—Colonial Meerschaum (Silicate of Magnesia), Tookai-tookai, Richmond River. Apparently a tertiary deposit, and frequently containing impressions of leaves. Although apparently local, and not forming very extensive deposits, this may arise from its not having been dug for in the neighbourhood of the shallow pit in the locality noted, whence the Specimens were obtained. Pipe Bowls are frequently made of it, of which one (No. 232) is exhibited.

9 Freeburn, Mr. F., *Woolli*.—Stone, Clarence River Heads. To show the Material used in the construction of the Breakwater there, where it is quarried on the spot.

10 Gother, K. Mann., *Sydney*.—Specimens of Iron Ore from Narara Creek, Brisbane Water, near Sydney.

11 Graham, John, *Sydney*.—One Block of Kerosene Shale, from Wollongong, New South Wales; One Case Kerosene Oil (Pioneer brand); One Case of Lubricating Oil; One Case of Naphtha.

12 Henderson, Mr., *Richmond River, N.S.W.*—Meerschaum and other Mineral Substances.

13 Hewitt, Mr. T. G., *Grafton*.—Iron Pyrites, neighbourhood of Newtonboyd, Clarence River. A fragment of a large block found on the surface.

14 Keene, William, F.G.S., *Government Examiner of Coal Fields*.—One Case containing Specimens of the Fauna and Flora, overlying the 11th seam of Coal worked in Stony Creek by Mr. Russell, in Anvil Creek by Mr. Farthing, and in Dalwood Creek; One Case of Specimens from Mr. Mitchell's Coal-pit, Bloomfield, East Maitland, showing six Coal Seams in a depth of sixty feet of sinking; specimen of Brown Cannel Coal, or Kerosene Shale, from Colley Creek, Liverpool Plains, New South Wales;

specimen of Brown Cannel Coal, or Kerosene Shale, from Burragorang, near Picton, New South Wales; specimen of Jet Coal from Lake Macquarie, near Newcastle; specimen of Pottery, or Porcellanate Rock, from Burwood Colliery, Newcastle; specimen of Pea Iron Ore.

16 LAMAN, MR. E., *Grafton.*—Shell Lime, Oyster Ground, Clarence River. The only Lime readily procurable on the River. The shells are obtained from Deposits, of considerable extent and depth, of Dead Oysters and Cockles (Arca Trapezizia), above high-water mark, several miles within the entrance of the River.

16*a* LAMBTON COLLIERY COMPANY, 46 *O'Connell-st., Sydney.*—Block of Lambton Coal from Lambton Colliery Company's Mines, Newcastle, N.S.W.

16*b* MANNING, JAMES, *Oaklands, Panbula, N.S.W.*—Five Bottles Ceramic Sand; One Bottle Sifted Kaolin, and Samples of Fire Bricks.

17 MORUYA SILVER MINING COMPANY.—Samples of Silver Ore from the Mines.

18 MOYES, ALDERMAN D.—Sandstone, Grafton, Clarence River. Shown as the Stone used in the construction of the principal Buildings in Grafton.

20 RENNY, WALTER, *Pitt-st., Sydney.*—Specimens of Silver and Lead Ore, from Woolgarlo, near Yass, New South Wales.

21 SHANNON, MR. C. M. A., *Nymboida.*—Antimony Ore (Sulphuret), Gordon Brook, Clarence River. Picked up on the surface; believed to exist in great abundance in the locality indicated.

22 SHANNON, MR. C. M. A., *Nymboida.*—Coal, Nymboida, Clarence River. From the surface, not worked, and extent unknown.

23 THE COMMISSIONERS FOR NEW SOUTH WALES.—Specimens of Coal from the Hunter River Coal Field—shown in five cases, containing Coal from the Stony Creek, Dalwood Creek, Rix's Creek, Mitchell's Creek, and Anvil Creek Mines.

23*a* THE CURRAWANG COPPER MINING COMPANY.—Specimens of Black and Black and Grey Sulphates of Copper Ore; and Specimens of Native Copper.

24 THE FITZROY IRON MINING COMPANY.—One Pig of Grey Iron, No. 1; One Pig of Grey Iron, No. 2; One Pig of Grey Iron, white; One Bar of Round and one Bar of Square Wrought Iron. All from the Works of the Fitzroy Iron Mining Company.

25 THE HARTLEY KEROSENE OIL AND PARAFFINE COMPANY (LIMITED).—Two Blocks of Cannel Coal, or Kerosene Shale, from the Hartley Mine; Two Tins of Burning Oil (Kerosene); One Tin of Crude Oil; One Tin of Lubricating Oil; One Block of Unrefined Paraffine.

26 THE ICELEY COPPER MINES.—Specimens of Copper Ore.

27 THE WESTERN KEROSENE OIL COMPANY.—One large Block of Cannel Coal, or Kerosene Shale, from Hartley.

28 VINDIN AND CO., *West Maitland, Hunter River.*—Six Hones, from Stone found at Mudgee.

29 WALKER, THOMAS, *Sydney.*—Specimens of Silver Ore, one Block of Granite, from Moruya River.

SECTION 2.—*Chemical and Metallurgical Products and Processes.*

30 ELLIOTT BROTHERS, *Pitt-st., Sydney.*—Specimens of Hydrocloric Acid, Nitric Acid, Sulphuric Acid, Granulated Sulphate of Iron, Bisulphate Soda, and Super-phosphate of Lime.

Class II.—Animal Products.

SECTION 4.—*Wool, Hair, Skins, Furs, Silk, Feathers, Horns, Hoofs, Bones, Guano.*

31 ATTWATER, MR. W., *Grafton.*—Kangaroo Skin of large size, and suitable for the manufacture of Leather.

32 BLANCH, MR. G., *Ulmarra.*—Quills of the Black Swan, Pelican (Pelecanus Conspicillatus), and Native Companion (Grus Australasianus), Clarence River.

33 BLANCH, MR. G., *Ulmarra.*—Potted Butter, Clarence River.

34 EBSWORTH, FREDERICK, *Sydney.*—Six Boxes containing part of Six Fleeces from Pure Imported Rams, in the Grease.

35 EBSWORTH, O. B., *Sydney.*—Two Samples of Wool from which the Colonial

Cloth is made. Not exhibited as specimens of Scoured Wool, but as the Wool of New South Wales, which can be supplied in any quantity.

37 HEWITT, MR. T., *Grafton.*—One Fleece Scoured Wool.

38 HINCHCLIFFE, ANDREW, *Waterloo Mills, Sydney.*—Two Boxes Samples of Scoured Wool.

39 JACOBS, ALDERMAN L., *Grafton.*—Swan Quills and Emu Feathers, Clarence River.

40 LESLIE, J. J., *Camperdown, near Sydney.*—Preserved Meats of various kinds, in tins.

41 MACGILLIVRAY, MR. JOHN, *Grafton.*—Opossum Skins (Two) of Two Kinds. One the Common Opossum (Phalangista Vulpina), the other the Brush Opossum (P. Canina), which are exhibited to show the superior quality of the fur of the latter, which is very plentiful in the district. Attention is also directed to the very beautiful fur of the Ring-tailed Opossum (Pesudocheirus Cooki), in the Natural History Collection.

42 SEARLE, MR. H. S.—Swan's Down, Clarence River.

43 WAINWRIGHT, MISS, 721 *George-st., Sydney.*—Sample of Silk. Prepared by Exhibitor.

44 WILCOX, MRS., *Grafton.*—Swan's Down and Quills, Clarence River. The suitability of the down of the Black Swan (Cygnus Atratus) for Ornamental Trimming may be judged of from this sample.

45 WILCOX, MR. J. F., *Grafton.*—Quills of the Wild Goose (Anseranas Melanoleuca), Clarence River.

46 WILCOX, J. F., AND MACGILLIVRAY, J., *Grafton.*—Collection of Specimens of Natural History, to illustrate the Zoology of the Clarence and Richmond River District, as follows:—(*a*) Stuffed Skins of Twelve Species of Mammalia; Seventeen Specimens. (*b*) Stuffed Skins of 135 Species of Birds; 150 Specimens. (*c*) Case of Skulls of 127 Species of Birds. (*d*) Stuffed Specimen of the Lace Lizard or "Guana" (Hydrosaurus Varius). (*e*) Stuffed Specimen of the Fresh-water Tortoise (Chelodina Longicollis). (*f*) Stuffed Specimen of the Cod Perch or "Murray River Cod" (which originally weighed upwards of 50 lbs.), caught in the Nymboida; the Stand of Red Cedar (Cedrela Australis). (*g*) Two Cases of Insects, the Wood used being the Silky Oak (Grevillea Robusta). (*h*) Specimen of the Mangrove Crab (Pseudocarcinus Gigas) on a stand of Bean-tree (Castanospermum Australe). (*i*) Collection of Land Shells in Box of White Pine (Araucaria Cunninghami). Prepared by Exhibitors.

SECTION 5.—*Meat, Fish, Fowl, whether Salted, Dried, Smoked, or Preserved; Gelatine, Isinglass, Milk, Butter, Cheese.*

47 AUSTRALIAN MEAT COMPANY, *Ramornie, on the Clarence River.*—Samples of Preserved Meat in tins.

48 HALL, SAMUEL, *South Creek, N.S.W.*—Two Samples of Cheese. Manufactured by the Exhibitor.

49 LODER, GEO. THOMAS, *Singleton, N.S.W.*—One Ham, and One Side of Bacon. Cured by Exhibitor.

50 MILLER, JAMES, *Counda, near Singleton, Hunter River.*—One Cheese.

51 WHITEHEAD, H. M., *Mossman's Bay, Sydney.*—Sample of Concentrated Essence of Beef, for the production of soup and beef tea, 1 lb. making four gallons of strong beef tea. Prepared by the Exhibitor.

52 WHITTEN, H., *Agent, Sussex-st., Sydney.*—One Keg of Butter from Wollongong.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

SECTION 7.—*Cereals, Agricultural and Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

53 BAKER, JOHN, *Wellington Grove, near Dungog, Williams River, N.S.W.*—Sample of Tobacco in Leaf.

54 Bawden, Mr. T., J.P., *Mayor of Grafton.*—Pods of Bean-tree (Castanospermum Australe), Clarence River. From the *inedible* seeds of this tree, which grows abundantly in all the brushes of the Clarence and Richmond districts, and which bears fruit in singular profusion.

58 Bawden, Mr. T., J.P., *Mayor of Grafton.*—Gum of Bean-tree (Castanospermum Australe), Clarence River.

63 Blanch, Mr. G.—Collection of Seeds, Clarence River, viz.:—Cape Barley, Lucerne, Peas (White Boilers), Chinese Maize, Broom Millet, and Red Spanish Onion. Grown by Exhibitor.

64 Bowman, William, *Skellater, Muswellbrook, on the Upper Hunter, N.S.W.*—Two Pecks Wheat; Two Pecks Cape Barley; Two Pecks Maize in cob.

65 Bultitude, Mr.—Spring Wheat, Clarence River. Grown by Exhibitor.

66 Bunker, Mrs., *Liverpool, N.S.W.*—Two Bottles Cayenne Pepper.

67 Bunker, Mrs., *Liverpool, N.S.W.*—Sample of Timber, known by the Aborigines as Coobar, from Narranderra.

69 Clark, Mr., *Grafton.*—Sarsaparilla, Clarence River. From the extract the Ærated Beverage known by the same name is frequently made, and the Decoction is occasionally used medicinally.

70 Church, John, *High-st., West Maitland, Hunter River.*—One Keg of Tobacco. Manufactured from Leaf Grown in the neighbourhood of Maitland.

71 Cobcroft, A., *Charlton, Hunter River.*—Two Pecks Wheat.

73 Colonial Architect's Department, *N.S.W.*—Collection of Samples of Australian Timbers, used for Building Purposes.

74 Cuthbert, John, *Sydney, Shipbuilder.*—Box with 30 Samples of Australian Timber, named and polished.

75 Drake, Edward, *Camberwell, near Singleton, Hunter River.*—Two Pecks White Maize; Two Pecks Cobbett's 90-day Maize; One Package Brown Millet.

76 Ebsworth, O. B., *Sydney.*—One Box and Two Bags, Containing Samples of Sea Island Cotton, Grown at Port Macquarie in a wet season, and consequently not a good colour—one Bag contains Cotton in an unginned state, and the other the Seed after being ginned by the Exhibitor. One Box and Two Bags of New Orleans Cotton, Grown on the Clarence River, bright and sound—One Bag contains the Cotton, the other the Seed; One Box and Two Bags containing Samples of New Orleans Cotton Grown on the Clarence River, rather stained but sound—One Bag containing Unginned Cotton, the other the Seed.

77 Fawcett, Mr., P.M., *Richmond River, N.S.W.*—Walking Sticks of Areca Monostachya; Stems of Calamus Australis, for rustic seats; Scented Root of Alyxia Ruscifolia.

78 Fawcett, Mr. C. H., J.P. *and* P.M., *Casino.*—Australian Rattan (Calamus Australis), two samples, Richmond River. Apparently well suited for Basket Work, &c., and procurable in abundance in all the brushes connected with the north arm of the Richmond, which appears to be its southern limit of growth.

79 Fisher, Mr. T., J.P.—Canna Arrowroot, Clarence River. Grown by Mr. H. Parsons.

80 Fraser, Mr. P. L., *Grafton.*—Spring Wheat, Clarence River.

82 Freeburn, Mr. F., *Woolli.*—Cypress Pine (Callitris Verrucosa, Var.) (Squared Block), Clarence River. Occasionally used for Veneers, but oftener for Shingles and Palings.

83 Golby, Abraham, Jun., *Larg's, West Maitland, Hunter River, N.S.W.*—Two Pecks Blue Imperial Peas; Two Pecks Small Maize, yields over 50 bushels to the acre.

84 Grafton Exhibition Committee.—Maize in Cob, Clarence River. A collection to which ten persons contributed, and showing samples of the different Varieties of Maize cultivated in the District, which last season exported 83,477 bags to Sydney, Melbourne, and Queensland.

87 Hill, Edward, Esq., *Sydney.*—Specimens of indigenous timber, polished.

88 Hinton, John, *Cabinetmaker, Hunter-st., Sydney.*—Four Specimens of Timber, adapted for Cabinet-work.

89 Lackersteen, A. A., 292 *George-st., Sydney.*—Samples of Dried Herbs for

Culinary Purposes, including Marjoram, Thyme, Sage, Parsley, Mixed and Celery Seed; also Cayenne Pepper, Pickled Chillies, and Horse Raisdh.

90 LAMAN, MR. E., *Grafton*—Tulip Wood (Owenia Venosa) (Block), Clarence River. A very handsome Wood, suitable for Cabinet Work.

91 LAMBERT, MR. W., *Grafton.*—Specimens of Wood (Polished), Clarence River. (*a*) (Rough) Grey Gum (Eucalyptus Sp.); (*b*) Tulip-wood; (*c*) Bean-tree; (*d*) Brown Pine; (*e*) White Pine (Araucaria Cunninghami), of which much is annually exported from the Richmond.

92 LEAF TOBACCO (Five Samples), Clarence River.—92*a*—Mr. L. Vorbeck, Grafton, Exhibitor; Mr. J. Kent, Grower. 92*b*—Mr. L. Vorbeck, Grafton, Exhibitor; Mr. Stephen Adrian, Grower, who obtained upwards of two tons from one acre at four pickings. 92*c*—Mr. Rush, Rocky Mouth, Grower. 92*d*—Mr. R. Schoefer, Grafton, Grower. 92*e*—Mr. M. Kreigar, Grafton, Grower.

93 LODER, GEORGE THOMAS, *Singleton, Hunter River.*—Two Pecks White Tuscan Wheat.

94 MACARTHUR, J. AND W., *Camden Park.*—One Bamboo Walking Stick. Grown by the Exhibitor.

96 M'ENCROE, EDWARD, *George-st., Sydney.*—One Box of Colonial Tobacco, Negrohead; and One Box of Tobacco made in the Colony from Imported Leaf.

98-9 MOORE, CHARLES, *Botanic Gardens.*—Specimens of the Chinese Rice Paper Plant, in various ages of Growth, from One to Seven Years; Specimen of Gymnostachys Anceps, a grass used for tying purposes. Timber Collection from New South Wales:—1. Trochocarpa Laurina—R. Brown. 2. Weinmannia Panniculosa—Ferdinand Mueller. 3. Sloanea Australis—Ferdinand Mueller. 5. Eugenia. 6. Laurinea. 7. Atherosperma Micranthum—Tulasne. 8. Tarrietea Actinodendron—Ferdinand Mueller. 9. Cryptocaria Glaucescens. 10. Geissois Benthami—Ferdinand Mueller. 11. Weinmannia. 13. Orites Excelsa—R. Brown. 14. Pennantia Cunninghami—Miers. 16. Laurinea. 18. Laurinea. 20. Anopterus Macleayana—Ferdinand Mueller. 21. Cargillia Pentamera—Ferdinand Mueller. 22. Stenocarpus Salignus—R. Brown. 23. Tetranthira Dealbata—R. Brown. 24. Syncarpia Leptopetala—Ferdinand Mueller. 25. Octoclinis Macleayana—Ferdinand Mueller. 26. Tarrietia Argyrodendron—Bentham. 28. Castanospermum Australe—Cunningham. 29. Helivia Ternifolia—Ferdinand Mueller. 30. Dysoxylon Rufum—Bentham. 31. Stenocarpus Sinuosus—Endlicher. 32. Elæocarpus Grandis—Ferdinand Mueller. 33. Akania Hillii—T. Hooker. 34. Helivia Præalta—Ferdinand Mueller. 35. Cedrela Taona L. 36. Grevillea Robusta—Cunningham. 39. Rhus Rhodanthemum—Ferdinand Mueller.

100 MUELLER, DR.—Timber from Cooper's Creek, New South Wales:—
Bauhinia Leichardtii—Ferdinand Mueller.
Acacia Salicina—Lindley.
Eucalyptus Microtheca—Ferdinand Mueller.
Eucalyptns Rostrata—Schlechtendal.
Atalaya Hemiglauca—Ferdinand Mueller.
Eremophila Bignoniflora—Ferdinand Mueller.
Acacia Homalophylla—A. Cunningham.
Hakea Stricta—Ferdinand Mueller.
Santalum Lanceolatum—R. Brown.
Orvenia Acidula—Ferdinand Mueller.
Busbeckia Mitchellii—Ferdinand Mueller.
Grevillea Striata—Brown.
Melaleuca Linarifolia—Smith.

101 MURPHY, JOHN, *Lochend, West Maitland.*—Sample of Maize.

102 NOWLAN, J. R., *Eelah, West Maitland, Hunter River.*—Sample of New Orleans Cotton, yielding at the rate of 530 lbs. clean cotton to the acre. Grown by the Exhibitor.

103 OSBORNE, T. K., *West Maitland.*—Sample of Cayenne Pepper; Specimen of the Australian Indigo Plant.

105 PENFOLD, E. T., 438 *George-st., Sydney.*—One Quarter-tierce of Colonial-made Tobacco, from Imported Leaf.

106 PENMAN, W., *Cabinetmaker, Pitt-st., Sydney.*—Two Specimens Australian Cedar, in Panel and Polished.

107 PRYOR, PHILIP, *Oswald, Hunter River, N.S.W.*—Two Pecks Oats.

108 SCHOEFER, MR. RUDOLPH.—Box of Cigars (Four Kinds) from Clarence River Leaf. Manufactured by Exhibitor.

109 STUCLEY, Mr. W., *Grafton.*—Specimens of Woods (Polished), Clarence River:—(*a*) Tulip-wood (Owenia Venosa); (*b*) Bean-tree (Castanospermum Australe), much used for Cabinet Work in the District; (*c*) Illawarra Pine (Podocarpus Spinulosa), frequently employed by Carpenters; and (*d*) Red Cedar (Cedrela Australis), the applications of which are sufficiently known in all the Australian Colonies.

110 TAYLOR, MR. W.—Black Dye, or Natural Ink, Clarence River. Obtained from the Berry of a Native Plant. The sample is three years old.

111 THE COMMISSIONERS OF THE PARIS EXHIBITION, from Mr. Moore, Director of the Botanic Gardens, *Sydney.*—Collection of 39 Specimens of indigenous timber, polished (see No. 90).

112 TRAVERS, MR., *Grafton.*—Canna Arrowroot, Clarence River.

113 VORBECK, MR. L., *Grafton.*—Case of Manufactured Tobacco (Colonial "Negrohead") from Clarence River Leaf. Manufactured by Exhibitor.

117 WILCOX, J. F., AND M'GILLIVRAY, J., MESSRS.—Collection of Ferns of the Clarence and Richmond District.

118 WYNDHAM, JOHN, *Dalwood, Crampton, Hunter River.*—Two Samples of Lucerne Seed, grown on the Hunter. This Lucerne produces over six tons to the acre each cutting, and can be cut from six to eight times in the year; Two Bottles Apple-tree Sap or Juice (Medicinal), 3 lbs. Apple-tree Gum, 3 lbs. Ironbark-tree Gum, 3 lbs. White Box-tree Gum, 3 lbs. Bastard Box-tree Gum, 36 lbs. Wattle Bark (this bark is the only bark used for tanning leather in New South Wales), 25 lbs. Currajong Bark (used for making ropes and nets), 10 lbs. Tea-tree Bark (supposed to be fit for paper-making), One Bundle Indigo Plant, 3 lbs. Gum from Spotted Gum-tree. All the above are indigenous to the district of Hunter, on the Hunter River, New South Wales.

119 ZANELLI, MR. ANGELO, *Ulmarra.*—New Orleans Cotton, Clarence River. Grown in Stony Soil. Planted in Oct., 1865; Picked in March, 1866. Estimated Produce, One Ton (in Seed) per Acre. Grown by Exhibitor.

SECTION 8.—*Flour and Meal, of every Variety and in every Form; Malt, Starch, Gluten, Sago, Tapioca, Arrowroot, Sugar, Confectionery.*

122 BLANCH, MR. GEORGE, *Ulmarra.*—Jar of Dried Peaches, Clarence River.

123 COLE, W., AND SON, *Tomago, Hunter River, N.S.W.*—Samples of Arrowroot; One Tin of Starch.

124 FISHER, MRS., *Grafton.*—Bottle of Grape Jelly, Clarence River.

125 GREGOR, MR. JOHN, *Woodford Island.*—Two Varieties of Sugarcane, Clarence River. Grown by Exhibitor.

126 HARDIE AND MITCHELL, *Biscuit Bakers, George-st., Sydney.*—Samples of Biscuits—Cabin, Navy, Abernethy, Pic-nic, York, and Cracker. Manufactured by the Exhibitors.

127 HENDERSON, MRS., *Grafton.*—Grape Jam, Clarence River.

128 HENDERSON, MRS., *Grafton.*—Jar of Grape Jelly, Clarence River.

129 HETHERINGTON, W. C., *Melville, near West Maitland.*—Two Samples of Arrowroot.

131 HIGGINS, JOHN, *Berrico, Gloucester.*—Sample of Arrowroot.

132 HOLLAND, REV. J., *Port Macquarie.*—Sugar. Made and grown by Exhibitor.

133 LODER, GEORGE THOMAS, *Singleton, Hunter River.*—Sample of Arrowroot.

134 MACKIE, REV. GEORGE, *South Yarra.*—Sample of Sugar, from cane grown at Kiama, 100 miles south of Sydney, by the Kiama Sugar Company.

135 MILLER, T. H., *West Maitland, Hunter River.*—One Case of Sugar, Manufactured from Imphee, shown in its various Stages of Desiccation.

136 MITCHELL, JOHN, *Dunmore.*—Sample of Maizena.

138 MOORE, CHARLES, *Director of the Botanic Gardens, Sydney.*—Sample of Starch

made from the Castanospermum Australe; Sample Refuse of Castanospermum Starch; Sample of Meal from the Castanospermum; Samples of the Seed Sliced and Dried, also Biscuits made of the same; Sample of Starch, from the Seed of the Common Pumpkin; Olives in Sea-water, Grown and Preserved in the Botanic Garden, Sydney; Olives in Ordinary Salt and Water, Grown and Preserved in the Botanic Gardens, Sydney.

139 MORT, THOMAS SUTCLIFFE, *Sydney.*—Sample of Maizena; Flour Manufactured from Maizena Corn introduced by Mr. J. J. Collett from America; Grown by Mr. Wm. Collett, at Moruya, and Ground by W. Ellison of the Gundary Mills, Moruya—Yield, 42 lbs. of Fine Flour to the Bushel of 60 lbs. (Wheat only yielding about the same), and grinding "very free."

140 NOWLAN, J. R., *Eelah, West Maitland, Hunter River.*—Sample of Sugar from Imphee. Grown and Manufactured by the Exhibitor.

141 PORTUS, HENRY D., *Raymond-terrace, Hunter River.*—Sample of Corn Flour.

142 ROBERTSON, MRS., *Grafton.*—Jar of Quince Jelly, Clarence River.

143 RUSH, MR., *Rocky Mouth.*—Canna Arrowroot, Clarence River.

144 SCOTT, THOMAS, *Brisbane Water.*—Sample of Sugar from the Sugar Cane. Made and grown by the Exhibitor.

145 SCOTT, WALTER, *Ash Island, Hunter River.*—Sample of Sugar from Cane Grown by the Exhibitor, and Manufactured by Mr. James M'Donald, Phœnix Park, Morpeth.

147 SOMERVILLE, MR. A.—Sugar Cane, Clarence River. Grown by Exhibitor.

148 TAYLOR, MR. W., *Carr's Creek.*—Box of Dried Peaches, Clarence River.

149 TAYLOR, MR. W.—Canna Arrowroot, Clarence River. Planted in rows 6 feet by 6, in a rich, loamy soil; Cultivated for three years; the Seed buried six inches; aspect of field northerly. Takes twelve months to mature; is manufactured into pulp by means of a revolving grater made by the grower, cleaned through sieves, and rendered perfectly pure by frequent washing in clear water. Grown by Exhibitor.

150 TOOTH, R. AND F., *Kent Brewery, Sydney.*—Sample of Pale Malt. Manufactured at the Premises of the Exhibitors.

151 LODER, GEO. THOMAS, *Singleton.*—One Tin Dried Quinces; One Tin Dried Peaches.

152 MACARTHUR, J. AND W., *Camden Park, N.S.W.*—One Bottle Olive Oil; Two Jars Preserved Olives; Two Jars Capers from the Thorny Caper; Two Jars Currants from the True Corinth Grape; Two Jars Arrowroot from Curcuma Augustifolia; Two Jars Brandied Cherries; Two Bottles Cayenne Pepper; One Bottle Catsup. All grown and prepared by the Exhibitors.

153 MELVILLE, J. K., *near West Maitland, Hunter River.*—Samples of Dried Peaches, Dried Apples, and Dried Quinces. Prepared by the Exhibitor.

154 MOORE, MRS. CHARLES, *Botanic Gardens, Sydney.*—Sample of Guava Jelly.

155 O'NEIL, THOMAS, 639 *George-st., Sydney.*—25 Specimens of Confectionery. Manufactured by the Exhibitor, and shown in a Case composed of a great variety of Australian Woods.

SECTION 9.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

156 ADAM, M. ELEONARD.—Eight Bottles of Red Wine, Clarence River. Grown by Mr. J. Bender.

157 ADAM, MR. ELEONARD.—Ten Bottles of White Wine, Clarence River. Grown by Mr. J. Bender.

158 CARMICHAEL, G. T. AND J. B., *Porphyry, William's River, N.S.W.*—Twelve Bottles of White Wine, vintage 1862, and twelve Bottles, 1865, made from the Reisling Grape; Twelve Bottles of White Wine, vintage 1866, made from the Verdeilho Grape. The Vines from which these Wines were made were planted in 1849. The soil is alluvial to the depth of from twelve inches to two feet, with a stiff clay subsoil. It has not been trenched, but simply prepared with an ordinary plough. The yield per acre in 1862 was about 200 gallons; in 1865, 250 gallons; and in 1866, 200 gallons.

159 DOYLE, JOHN F., *Kaloudah, Hunter River.*—Four Bottles of Tokay and Shiraz Four Bottles of Reisling and Shiraz; Four Bottles of Kaloudah Red; Four Bottles of Burgundy; Four Bottles of Muscatel; Four Bottles of Brandy.

159*a* EBSWORTH, O. B., *Sydney.*—Three Samples Wine, of six bottles each, grown by Thomas Barker, Esq., Marylands, near Camden, New South Wales.

159*b* FALLON, J. T., *Albury.*—Eleven Bottles Reisling, Eleven Bottles Brown Muscat, Twelve Bottles Tokay, Twelve Bottles Aucarot Wines. Grown and made by the Exhibitor.

160 HELDT, MR. GEORGE, *Double Swamp.*—Three Bottles of Red Wine, Clarence River. Grown by Exhibitor.

161 HELDT, MR. GEORGE, *Double Swamp.*—Three Bottles of Red Wine, Clarence River. Grown by Exhibitor.

162 JENKINS, R. L., *Nepean Towers, N. S. W.*—Six bottles of Colonial Wine.

163 KLAUSS, MR. VALENTINE.—Six Bottles of White Wine, Clarence River. Grown by Exhibitor.

164 KLAUSS, MR. VALENTINE.—Four Bottles Red Wine, Clarence River. Grown by Exhibitor.

165 KNAGGS, R. C., AND CO., *Hunter-st., Newcastle.*—Six Bottles of Dalwood Quinine Wine.

166 KREIGAR, MR. M., *Grafton.*—Bottle of Red Wine, Clarence River. Grown by Exhibitor.

167 LALLBACH, MR. GEORGE, *Smith's Flat.*—Eight Bottles of White Wine, Clarence River. Grown by Exhibitor.

168 LINDEMAN, H. J., *Cawarra, Gresford.*—Six Pint Bottles of White Wine, from Cawarra Vineyard, district of the Paterson, New South Wales.

169 LUMSDAINE, HENRY, *Chief Inspector of Distilleries and Sugar Refineries, Sydney.*—Spirit, the Produce of Colonial Treacle and Sorghum Juice, viz., White Spirit; Coloured Rum and Whisky, from Malted Barley and Sorghum.

170 MACARTHUR, HON. JAMES AND SIR WILLIAM, *Camden, N.S.W.*—Wines, the Growth of Camden Park, viz.:—Eight Bottles of Red, 1864; Eight Bottles of White, 1864; Eight Bottles of White, 1858; Six Bottles of White, 1856; Six Bottles of Muscat, 1853; Six Bottles of Muscat, 1851 (this Wine received the highest Prize, No. 15, of any Australian Wine at Paris in 1855); Six Bottles of Muscat, 1845 (taken from the Cask, having been 21½ years in wood, for the purpose of being Exhibited at Melbourne, as a specimen, not of the excellence but of the endurance of Australian Wines. It was the produce of an indifferent vintage, and at two years old was supposed to be quite spoiled; having after a time recovered itself, it has been kept in wood for experiment.

171 MEALY, MR. JOHN, *Dovedale.*—Two Bottles of Brandy made from Lees of Wine, Clarence River. Manufactured by Exhibitor.

172 MORGAN, MR. S., *Riverston.*—Ten Bottles of Red Wine, Clarence River. Grown by Exhibitor.

173 PAGE, MR. J. C., *Retreat.*—Nine Bottles of White Wine, Clarence River. Grown by Exhibitor.

174 SCHAUPP, MR. J., *Grafton.*—Bottle of Red Wine, Clarence River. Grown by Exhibitor.

175 SCHAUPP, MR. JACOB, *Grafton.*—Two Bottles of White Wine, Clarence River. Grown by Exhibitor.

176 WILCOX, MRS., *Grafton.*—Two Bottles Catsup, Clarence River.

177 MONK, D. J., *Wattle-st., Sydney.*—Six Bottles White Wine Vinegar; Six Bottles Brown Vinegar.

178 O'NEIL, E. H., 178 *Pitt-st., Sydney.*—Case of Perfumes, Manufactured from Flowers indigenous to New South Wales. Exhibited by the Manufacturer, who also exhibits the Case, made of Scented Woods entirely of Australian growth.

179 WHITEHEAD, WILLIAM, *Wagga Wagga.*—One Dozen of Colonial Wine, Nixon's Gregadoo.

180 WYNDHAM, MESSRS., *Dalwood, Branxton, Hunter River.*—Six Bottles of White Bukkulla, 1863; Six Bottles of Red Bukkulla, 1863; Six Bottles of Dalwood White, 1862; Six Bottles of Dalwood White, 1863; Six Bottles of Dalwood White, pints, 1863; Six Bottles of Dalwood Claret, 1865; Twelve Bottles of Dalwood Red, 1865; Six Bottles of Kirkton, 1865;

Six Bottles of Bukkulla White, 1865; Six Bottles of Dalwood Red, 1862; Six Bottles of Bukkulla Red, 1865; Eight Bottles, pints, Merton Wine.

Class IV.—Manufactures and the Useful Arts.

SECTION 11.—*Porcelain and Pottery, Glass, Iron and Hardware, Cutlery, Wickerwork.*

180a BROWN, JAMES A., *Sussex-st., Sydney.*—Three Specimens of Glass Carboys and Six Mineral Water Bottles. Made in Sydney.

181 FIELD, THOMAS, *George-st., South Sydney.*—Collection of Specimens of Pottery. Made by the Exhibitor.

182 GOODLET AND SMITH, *Parramatta-st.*—Specimens of Pottery.

183 GRIBBEN, JOHN, 80 *Elizabeth-st., Sydney.*—A Variety of Twelve Descriptions of Horse Shoes, forged from New South Wales Iron, and many invented by the Exhibitor.

184 RUSSELL, P. N., AND CO., 442 *George-st., Sydney.*—Samples of Iron Castings, from the Fitzroy Iron Mines, New South Wales—Queen's Arms, Coloured and Gilt; Two Garden Chairs; Sheets of Balconies; and One Large Cast Steel Bell.

185 WELHAM, NATHAN, *Barwood, near Newcastle.*—An assortment of Pottery Ware.

SECTION 12.—*Leather and its Applications, Bonedust, Animal Charcoal and Oils, Blood, Ammonia, Glue, Fat, Tallow, Stearine, Honey, Wax, Soap, Candles, Varnishes.*

186 ALDERSON AND SONS, *Tanners, Elizabeth-st., Sydney.*—Samples of Sole Leather; Black and Brown Harness Leather; Bridle Leather; Stirrup and Kip Leather; Calf Skins; Enamelled Hides for Coach-builders; Enamelled Leather for Bootmakers; and Japanned and Enamelled Kangaroo and Calf Skins. Samples of Boots made by Exhibitors; Three Saddles made by Exhibitors; and Specimens of Saddlery and Mill Belting. Pair of Cast-iron Lasts, similar to those in use at the Exhibitors' Manufactory in Sydney; One Pair Polished Steel Sole-cutting Knives, made on their own premises.

187 BEGG, JOHN E., *Glenmore Tannery, Sydney.*—Two Sides Sole Leather.

188 BELL, HENRY, *Pitt-st., Sydney.*—Samples of Beef and Mutton Tallow; sample of Neatsfoot Oil; sample of Bonedust.

189 BERRY, J. S., AND CO., 656 *George-st., Sydney.*—Sample of Glue. Manufactured at Botany, near Sydney.

190 BRUSH, JOHN, 407 *George-st., Sydney.*—One Lady's Side Saddle and two Gentlemen's Saddles.

191 BUNKER, MRS., *Liverpool.*—Beeswax.

191a COCKSEDGE, T. Z., *Brickfield-hill, Sydney.*—One Pair of Wellington Boots.

192 GREGOR, MR. JOHN, *Woodford Island.*—Two Bottles Honey, Clarence River.

193 GREGOR, MR. JOHN, *Woodford Island.*—Unbleached Beeswax, Clarence River.

194 JONES, JOHN, *Deniliquin.*—Boots and Shoes.

195 LANCASHIRE, W. B., 121 *Bathurst-st. E., Sydney.*—Two Portmanteaus.

197 LOBB, JOHN, 229 *Pitt-st.*—Specimens of Colonial-made Boots. Manufactured for the Exhibitor by hand-work of native-born Australians.

198 MITCHELL, W. S., *Wagga Wagga.*—One Gentleman's Hunting Saddle and one Gentleman's Bush Saddle. These have Improved Plated Cantles, Felt-lined Seats, with Skirts all round, being Improvements claimed by the Exhibitor.

199 PATEN, JOHN, *East Maitland, Hunter River.*—Samples of Bonedust.

200 PAYNE, ALDERMAN R., *Grafton.*—Two Bottles Honey, Clarence River.

201 SADDINGTON AND SONS, *South Creek and Sydney.*—Three Sides Sole Leather. Made by Exhibitors.

202 VICKERY, JAMES, *George-st., Sydney.*—Samples of Ladies' Rivetted Boots. Made by the Exhibitor, by Machinery, at his Manufactory, Waverly, near Sydney.

203 YORK, CHARLES, *Glebe Island, Sydney.*—Samples of Beef and Mutton Tallow.

Section 13.—*Fabrics in Silk, Wool, Cotton, Hair, Flax, Hemp, Thread, Straw—Spun, Woven, Felted, or Laid—Plain or Mixed.*

204 Attwater, Mrs., *Grafton.*—Hat of Corn Husks, Clarence River.
205 Bawden, Mrs. T., *Grafton.*—Two Hats of Sycamore Fibre, Clarence River.
206 Blanch, Mrs. Elizabeth, *Ulmarra.*—Manufactures in Cabbage-tree (Corypha Australis)—Bonnet, Plait, and Hat, Clarence River.
207 Bunker, Mr., *Liverpool.*—One Hat made of the Corn Husk.
208 Creer, Joseph, *High-st., West Maitland.*—Case of Brooms. Made from Millet grown in the Hunter River District by the Exhibitor.
209 Ebsworth, O. B., *Sussex-st. Cloth Mills, Sydney.*—Eighteen samples of Australian Tweed. Made wholly from New South Wales Wool by the Exhibitor, at his Works, Sussex-street, Sydney.
210 French, John, and Son, 1 *Wynyard-lane, Sydney.*—Samples of Colonial Tweed and Wool, in the various stages of making Cloth, from their Factory at Bowenfels, New South Wales.
211 Kratz, Mr. H., *Grafton.*—Millet Brooms, Clarence River. Manufactured by Exhibitor.
212 M'Mahon, M., 410 *George-st., Sydney.*—Samples of Brush Ware.
213 M'Mahon, J., *George-st., Sydney.*—Mat made of the Corn Husk.
214 Reid, J. C., *Governor of Darlinghurst Gaol.*—Specimens of Mats and Matting. Made by Prisoners in Darlinghurst and Berrima Gaols, New South Wales.
215 Wagner, Mrs. C., *Grafton.*—Artificial Flowers in Silk and Silver, Clarence River.
216 Wilcox, Mrs., *Grafton.*—Hat of Corn Husks, Clarence River.
217 Woolnough, Horace, *Wynyard-st., Sydney.*—Cabbage Tree Hats and Plait for same, with Tools of Manufacture and Raw Material.
218 Zions, H., *George-st., Sydney.*—Coat, made by the Exhibitor, forming a Sac Coat one side and a Paget Coat the other side; lined throughout.

Section 14.—*Articles of Clothing; Lace, Embroidery, Specimens of Native Workmanship.*

224 M'Mahon, M., 410 *George-st., Sydney.*—Specimens of Articles manufactured from South Sea Island Tortoiseshell; Card Basket, Dressing and Fancy Combs, Shuttles, &c.; made by the Exhibitor; specimens of Hair Brooms, Brushes, and Millet Brooms.
225 Shearer, Mrs. John.—Knitted Needlework, Clarence River.
226 Strather, James, *Camden, N.S.W.*—Six Millet Brooms.
227 Wilcox, Mr. J. F., *Grafton.*—Aboriginal Stone Hatchet, Clarence River. Turned up by the Plough; formerly used by Aborigines of the District.

Section 15.—*Miscellaneous.*

228 Berncastle, Dr., *Sydney.*—A Tin Box containing antidotes to the bites of Snakes, adapted for bush use.
229 George, Mr. Samuel, *Grafton.*—Building Bricks, Clarence River. An average Sample of the Bricks employed for Building purposes about Grafton, where the supply of suitable Clay is unlimited. Manufactured by Exhibitor.
230 Harper, Charles, 51 *King-st. W., Sydney.*—A Box of Ointment made from Australian Plants, and used in the cure of Sores, &c.
231 Jordan, Mr. George, *Grafton.*—Turnery in Bean-tree (Castanospermum Australe), Red Cedar (Cedrela Australis), Tulip-wood (Owenia Venosa), Clarence River.
232 MacFadden, Mr. John, Jun.—Pipe Bowl of Colonial Meerschaum (Silicate of Magnesia), Richmond River. See No. 8.
232*a* Southern, T. J., *Sydney.*—Two Bottles "Mernala," a preparation from Native Herbs for the cure of Diarrhœa and Dysentery.
232*b* Maguire, H. J., *Sydney.*—Two Bottles Church Incense.
232*c* Salisbury, James, 377 *Bourke-st., Sydney.*—Three Bottles Blacking, One Bottle Harness Blacking, One Box Paste Blacking.
233 Stucley, Mr. W., *Grafton.*—Two Billiard Cues of Bean-tree (Castanospermum Australe), Clarence River.

Class V.—The Ornamental Arts.

SECTION 16.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Carvings.*

234 ALLAN, JOHN, 297 *George-st., Sydney.*—A Cedar Case, containing Specimens of Seal Engraving on Stone. By Exhibitor, who acquired the art in the Colony.
235 COHEN, A., *Wynyard-square, Sydney.*—Photographic View of Hotel.
236 COLONIAL ARCHITECT'S DEPARTMENT.—Series of Views of some of the Public Works and Buildings of the Colony, taken by Photography.
237 COMMISSIONERS OF THE PARIS EXHIBITION.—Series of Street Views of Sydney.
238 CUTHBERT, J., *Shipbuilder.*—View of Cuthbert's Patent Slip, with Ship on Stocks.
239 DEGOTARDI, JOHN, *Photographer, Robin Hood lane, Sydney.*—An Assortment of Photographic Views of Sydney and neighbourhood.
240 ELYARD, SAMUEL, *Colonial Secretary's Office, Sydney.*—Five Water-colour Paintings—"Australian Scenery." By the Exhibitor.
241 FELTON, MISS MYRA, *Carlton-terrace, Sydney.*—One Painting in Dry Colours —"G. V. Brooke, in the character of 'Virginius';" One Original Painting in Dry Colours—"Good News;" Portrait of a Skye Terrier.
242 GEDYE, MRS. C. T., *Amateur, "Lurlei," Woollahra, Sydney.*—Water-colour Painting—"View from Mount Bowen, South Kurrajong."
243 GLAISTER, T. S., *Pitt-st., Sydney.*—Four Photographic Views.
244 HOLROYD, A. T., ESQ., *Parramatta.*—Photographic View of Orangery.
245 MARTENS, CONRAD, *North Shore, Sydney.*—Water-colour Painting—"View from the North Shore of Port Jackson."
246 MUNICIPAL COUNCIL OF GRAFTON.—Ten Photographs—Views in Grafton (Clarence River) and its Vicinity. Produced by Mr. Conrad Wagner.
247 PRICE, THOMAS, 7 *Bligh-st., Sydney.*—Collection of Miniatures, painted in Oil by the Exhibitor, comprising—"The Royal Family," "Sir John and Lady Young," and others.
248 PYE, JAMES, *Parramatta.*—Photographic View of Two large Orange Trees at the North Rocks, Parramatta. By J. Degotardi.
249 ROBERTS, J. R., *Sydney.*—Water-colour Painting—"View on Clarence River."
249*a* ROWE, THOMAS, *Architect, Sydney.*—Photographic View of Vickery's Buildings, Pitt-street, Sydney.
250 SCOTT, CAPTAIN P. M., *Sydney.*—Two Water-colour Paintings—"Views of Australian Scenery," by Mrs. Scott, Amateur; and one Pencil Drawing —"View of Port Jackson."
250*a* SEVERN, A. H., *Union Bank of Australia.*—Photographic View of the Spot on which Captain Cook and Sir Joseph Banks landed in Botany Bay in the year 1770, with the inscription placed there.
251 TERRY, F. C., 35 *Alma-st., Sydney.*—Water-colour Painting—"The Bush Track."
252 THURSTON, MRS., *Bowenfels.*—Two Water-colour Paintings—"Australian Scenery."
252*a* Photographic Views of Villa Residences near Sydney, as follows:—Allen, the Hon. G.—"Toxteth Park;" Bradley, H. B., Esq.—"The Terraces;" Breillatt, T. C., Esq.—"Enmore Road;" Billyard, W. W., Esq.—"Kirketon;" Caldwell, Mrs.—"Orielton," "Australian Club, Bent-street, Sydney," "Civil Service Club, Macquarie-street, Sydney;" Campbell, the Hon. Alexander—"Rosemount;" Dickson, Mrs.—"Rosemount;" Josephson, J. F., Esq.—Two Views of "Enmore;" Holt, Thomas, Esq.—"Stanmore;" Lamb, Mrs.—"Larbert;" Lamb, Walter, Esq.—"Greenknowe;" Lamb, John D. V., Esq.—"Darling Point;" M'Lean, J. D., Esq.—"Quiraing;" Mort, Thos. S., Esq—Two Views of "Greenoakes;" Mort, Henry, Esq.—"Mount Adelaide;" Moore, Henry, Esq.—"Barncleuth;" Clarke, Rev. W. B.—View of "St. Thomas's Church and Parsonage, North Shore;" Prince, Henry, Esq.—"Craigend;" Randwick Municipal Council—"Hall," "Randwick Church," "View of Randwick Destitute Children's Asylum;" Russell, P. N., and Co.—Eight Views of their Foundry and Engineering Works; Towns, the Hon. Robert—"Cranbrook;" Watkins, John, Esq.—"Aston Lodge, Randwick;" Wingate, Major, "Percy Lodge;" Sydney Gas Company—Two Views of their Works; Little, Miss—"Rockwall;" Tooth, Fred., Esq.; King, G., Esq., "Waratah."

253 WILSHIRE, W. AND C., *Royal Hotel, Sydney.*—Photographic View of Hotel.
253*a* NAYLOR, JAMES, *Bega.*—Paper Weight, representing Apollo, modelled in silver and gold, with marble stand.

SECTION 17.—*Plate, Jewellery, Working in Metals.*

254 QUIST, O. L., *Jeweller, Hunter-st., Sydney.*—Specimen of Silversmith's Work, Vase and two Cups made of Emu Eggs, and Mounted with Silver; Rosewood Salver, mounted with Silver.
255 VEYRET AND DELARUE, MESSRS., *Jewellers, George-st., Sydney.*—Specimens of Silversmith's Work in Mounting Emu Eggs, one as a Clock Stand and one as an Inkstand. Designed and manufactured by the Exhibitors.
256 WILLIAMS, CHARLES, *Sussex-st., Sydney.*—Specimens of Graining Woods and Marbles, eleven Panels.

SECTION 18.—*Furniture and Decorations.*

257 MOORE, W. B., *Ashfield, near Sydney.*—Two Rustic Seats.
258 GALE, SAMUEL, *Woollahra, near Sydney.*—Model of a Colonial Villa, in Shellwork. Made by the Exhibitor.
259 EVANS, DANIEL, 12 *Domain terrace, Sydney.*—Model of a Cottage, in Shellwork. Made by Exhibitor.
260 CROWNSON, A., 149 *Castlereagh-st., Sydney.*—Specimen of Crownson's Patent Portable Camp Tent Frames, from 1 lb. weight and upwards.
261 REID, J. C., *Governor Darlinghurst Gaol.*—One Plate made of various colonial woods by a prisoner in the gaol.
262 RUSSELL, P. N., AND CO., *Sydney.*—Seats for Balconies and Gardens in cast iron.
263 THE COMMISSIONERS FOR NEW SOUTH WALES.—Loo Table made of Australian pine.
263*a* ANDERSON, J. H., *George-st., Sydney.*—Six Specimens of Printed Music.
263*b* COMMISSIONERS FOR NEW SOUTH WALES.—Copy of the *Sydney University Calendar* for 1866, bound in crimson morocco and emblazoned.

SECTION 19.—*Printing, Stationery, and Bookbinding.*

264 DAVIDSON, W. R., *Surveyor General of N.S.W.*—Specimens of Maps of the Colony of New South Wales, mounted and varnished, including Map of the Colony and County of Clarence, drawn on stone. Map of the County of Wynyard, engraved on stone. Map of the County of Argyle, drawn on paper and transferred.
265 MAYOR AND TOWN CLERK OF GRAFTON.—Statistics of the Municipality of Grafton, Clarence River, Printed. Prepared by Exhibitors.
265*a* RICHARDS, THOMAS, *Printer to the Government of N.S.W.*—Specimens of Printing at the Government Printing-office, and also of Bookbinding.
265*b* RICHARDS, THOMAS, *Government Printer, N.S.W.*—Two Copies of a Grammar of the Australian Languages by the Rev. W. Ridley, M.A., bound in morocco and title printed in colours.
266 STEVENSON, MR. R.—*Clarence and Richmond Examiner* Newspaper of May 29, 1866. Printed by the Exhibitor.

SECTION 20.—*Architectural and Engineering Models and Drawings, Maps, Charts, Plans, and Sections.*

268 HOLROYD, A. T., *Sherwood Scrubs, Parramatta.*—Model of a Farm Gate.
269 KIRKWOOD, D. S., *Shoalhaven, N.S.W.*—Model of a Steam Boiler intended to prevent the burning out of Fire Bars; also a Model of a Timber Bridge adapted to colonial purposes.
269*a* RANDLE, WILLIAM, *Sydney.*—Working Model of a Railway Locomotive Engine and Tender.

SECTION 21.—*Miscellaneous.*

270 WAINWRIGHT, JORDAN, 721 *George-st., Sydney.*—A Flute made of Myallwood, with 8 keys, mounted in silver and enclosed in a native Rosewood case.

SECTION 22.—*Motive Machinery and Carriages.*

271 FLETCHER, D., *Wynyard-square, Sydney.*—Specimen of Dental Mechanism, by the Exhibitor, being a closely fitting plate for the human mouth.
272 KEENE, WILLIAM, *Newcastle.*—The Saccharometer adopted by the Hunter River Vineyard Association.
273 ANDERSON, J. H., *George-st., Sydney.*—Debain's Piano Mecanique, and Clarke's Patent Mechanical Leaf Turner.

ADDENDA.

274 KREFFT, GERALD, *Curator Sydney Museum.*—Case containing Casts to illustrate the Dentition of the Thylacoleo Carnifex and other Australian Mammalia:—

1. Portion of Left Ramus, Lower Jaw, of a New Animal, probably a Carnivora.
2. Skull and Lower Jaw of Thylacoleo Carnifex (restored).
3. Left Lower Incisor of Thylacoleo Carnifex (restored).
4. Right Lower Incisor of Thylacoleo Carnifex (restored).
5. Right Lower Incisor of a Kangaroo Rat (Bettongia Campestris), to show the similarity of form and structure to the corresponding tooth in Thylacoleo.
6. Portion of Left Ramus, Lower Jaw, of Gigantic Hypsiprymnus, or Macropus, to show the manner in which the large premolar tooth was worn in these extinct Kangaroos.
7. Upper Incisor, Diprotodon.
8. Canine of Modern Tiger (Felis Tigris), to show the difference between a canine and an incisor, and to prove that the extinct marsupial lion (?) was far inferior to the great feline animals of the present time.
9. Lower Jaw of Thylacoleo Carnifex restored, the left ramus, with broken-off incisor, being cast from the original specimen in the Australian Museum.
10. The Left Ramus, Lower Jaw, of a Bettongia, or Kangaroo Rat (Bettongia Campestris), showing the great permanent premolar pushing through and replacing the first molar tooth.
11. Right Ramus of the same, Animal with incisor tooth and spurious premolar, the growing permanent premolar observable beneath; this tooth will be double the size of the one *in situ*. It pushes out the first molar, so that the remaining teeth in their disposition and number approach the dentition of Thylacoleo.
12. Tooth of an old "Caravan Bear" (Ursus Arctos), to show how canine teeth are sometimes worn similar to incisors when the animal gnaws iron bars.
13. Left Ramus, Lower Jaw, of a species of Nototherium.

275 DALTON BROTHERS, *Orange, N.S.W.*—Sample of Wheat.
276 RICHARDS, WILLIAM, *Orange.*—Sample of Wheat.
277 TRAPPITT, W. T., *Orange Mills, Orange.*—Two Samples of Wheat.
278 M'LENNAN, JOHN, *Kelly's Plains, New England.*—Sample of Wheat.
279 DANGAR BROTHERS, *New England.*—Two Samples of Wheat, One Sample Maize, and One of White Oats.
280 BROWN, J., *Armidale.*—One Sample Wheat; One Sample White Oats.
281 M'ARTHUR, J. AND W., *Camden.*—One Sample White Maize; One Sample Small Yellow Early Maize; One Sample Large Yellow Early Maize, weight 66 lbs. to the bushel.
282 MOORE, CHARLES, *Curator Botanical Gardens, Sydney.*—Samples Brooms, made from the Cabbage-tree Palm.
283 KUMMERER, R., *Sydney.*—Three Cases of Clothing Wool and Three Cases of Combing Wool.
284 BELL, HENRY, *Sydney.*—One Sample each first and second Scoured Wool.
285 JAQUES, THEODORE J., *Registrar-General, Sydney.*—Statistical View of New South Wales for the last Twenty Years.
286 EBSWORTH, F., *Sydney.*—Case with 100 Samples of New South Wales Wool.
287 THE COMMISSIONERS.—One Case of Wax Models of Fruit, the produce of New South Wales.

TASMANIAN COURT.

[Tasmanian Court, West Side (South End) of Great Hall, next to Western Australian Court.]

Class I.—Mineral Products.

GROUP 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Lime, Cements, Clay, Salt.*

1 Royal Society of Tasmania.—Gold Dust, from the Third Basin on the South Esk River, near Launceston.

2 Royal Society of Tasmania.—Gold, from the River Inglis, North-west Coast.

3–5 Royal Society of Tasmania.—Gold, from Fingal. Nugget from Surface.

6 Royal Society of Tasmania.—Gold in Quartz, from Ironstone Creek, Huon River.

7–8 Royal Society of Tasmania.—Gold, from Oyster Cove.

9 Royal Society of Tasmania.—Gold Dust in Iron Sand, from River Hellyer, North-west Coast.

10 Norwood, W. J., Launceston.—Quartz containing Gold, from the Union Company's Quartz Reef at Mangana. Sixteen specimens.

11 Gould, Charles, Government Geologist, as Commissioner of Tasmania.—Brown Hematite, from Ilfracombe. This Ore is found in very large quantities near Ilfracombe, on the River Tamar, about seven miles from the beach.

12 Gould, Charles, Government Geologist.—Brown Hematite, Impure, from a Surface Deposit, from the Ironstone Hills.

13 Gould, Charles, Government Geologist.—Brown Hematite, from another locality.

14 Gould, Charles, Government Geologist.—Hematite, from a Vein on Middle Arm Creek.

15 Gould, Charles, Government Geologist.—Hematite, from Brandy Creek.

16 Gould, Charles, Government Geologist.—Magnetic Iron Ore, from Ironstone Hills, West Tamar.

17 Calder, J. E., Surveyor-General.—Iron Sand (Titaniferous), from North-west Bay.

18 Howden, A., Launceston.—Oxide of Iron.

19 Abbott, John, Hobart Town.—Ironstone, from Middleton, in D'Entrecasteaux Channel.

20 Baker, W., Hobart Town.—Coal (Anthracite), from New Town. This Coal occurs in thin seams, and is used in the City for Fuel.

21 Howden, Archibald, Launceston.—Tasmanian Coals. In a Glass Case, containing Twelve Samples, with Shale and Lignite from various parts of the Colony.

22–3 Toby, Charles, Secretary to the Seymour Coal Company.—Coals from the Lower Seam and from the Upper Seam, Seymour Coal Mines.

24 Wintle, S. H., Hobart Town.—Geological Specimens.

25 Toby, Charles, Secretary to the Seymour Coal Company.—Coke, produced at the Gas Works from New South Wales Coal.

26 Royal Society of Tasmania.—Topazes, from Flinders Island. Two Hundred Specimens.

27 Whyte, Hon. Jas., Hobart Town.—Fossiliferous Limestone, from Lindisferne.

28 Boyd, J., Port Arthur.—Fossiliferous Limestone, from Port Arthur.

29 Glover, Miss, Horsecroft.—Limestone, from Sorell. One side Polished, to show the Fossils. Blocks of any size can be obtained.

30 Woolnough, William, Exton.—Limestone in its rough state, from Exton.

31–32 Dally, Messrs., Ilfracombe.—Limestone and Lime.

33 Howden, A., Launceston.—Lime. In a small bag.

34 Calder, J. E., Surveyor-General.—Marble, from Bruni Island.

35 Picket, J., Chudleigh.—Dark Marble, Polished.

36 Dally, Messrs., Ilfracombe.—White Marble, Polished.

37 Dally, Messrs., Ilfracombe.—Dark Dove Marble, Polished.

38 Galvin, C., Launceston.—Granite, from the Cataract Hill, Launceston.
39 Toby, Charles, Secretary to the Seymour Coal Company.—Granite, from the Seymour Coal Company's Yards.
40 Gibson, David, Glasslough.—Two Blocks Granite.
41 Drysdale, John, Launceston.—Two Blocks Blue Granite.
42 Gould, Charles, Government Geologist.—Serpentine, from West Tamar. A Green Rock, capable of taking a high polish.
43 Middup, Alfred, Launceston.—Coral, from Bridport.
44 Kermode, Hon. R. Q., Mona Vale.—Freestone, from Ross. This is much used as a building stone.
45 Pitfield, J.—Freestone, from Kangaroo Point. Called White Liver Rock, which can be obtained of any dimensions up to 20 feet thick.
46 Pitfield, J.—Freestone, from Kangaroo Point. Called White Rock; obtainable of any dimensions, from six inches to two feet thick.
47 Nicol, A. M., Hobart Town.—Freestone, from Cambridge. A White Silicious Sandstone, which hardens on exposure to the weather.
48 Abbott, John, Hobart Town.—Freestone, from Rookwood. This Sandstone immediately overlies the Coal at Rookwood.
49 Boyd, J., Port Arthur.—White Freestone, from Port Arthur, squared and dressed. In ordinary use for house building.
50 Boyd, J., Port Arthur.—Brown Freestone, from Port Arthur.
51 Birth and Co., Hobart Town.—Freestone, from Hobart Town. Largely used in house building in Hobart Town.
52 Nicol, A. M., Hobart Town.—Freestone, from Bothwell. This can be got in large slabs with a smooth face, which require no working.
53 Kermode, Hon. R. Q., Mona Vale.—Freestone.
54 Jackson, Adam, Ross.—Freestone, from Ross.
55 Maddox, George, M.D., Launceston.—Freestone, from West Tamar.
56 Abbott, Hon. E., Clarence.—Natural Pavement, from East Bay Neck.
57 Boyd, J., Port Arthur.—Road Metal. Broken, to show how it is applied to roads in Tasmania.
58 Boyd, J., Port Arthur.—Shell Lime, from Port Arthur.
59 Boyd, J., Port Arthur.—Sand, for Glass Making.
60 Birth and Co., Hobart Town.—Grindstone, from Hobart Town.
61–2 Pitfield, J., Kangaroo Point.—Two Grindstones, from Kangaroo Point.
63 Jackson, A., Ross.—Grindstone of White Freestone, from Ross.
64–5 Boyd, J., Port Arthur.—Yellow Clay, White Clay.
66 Abbott, Hon. E., Clarence.—Clay, from Sorell.
67 Toby, Charles, Secretary to the Seymour Coal Company.—Fire Clay, from the Seymour Coal Company's land.
68 Toby, Charles, Secretary to the Seymour Coal Company.—Prepared Fire Clay.
70 Abbott, Hon. E., Clarence.—Red Ochre.
71–4 Boyd, J., Port Arthur.—Red Ochre, from Port Arthur; Fine Salt, Coarse Salt, Sandstocks.
75 Moore, Dr., New Norfolk.—Marl, 56 lbs. weight, from New Norfolk. Very plentiful; an excellent manure. Is useful for absorbing ammonia.
76 Backhouse, R., Sandy Bay.—Marl, from Sandy Bay.
77 Wilkinson, John, Elwick.—Petrified Wood, from Elwick, O'Brien's Bridge.
78 Butcher, Mrs., Richmond.—Pipeclay, from Richmond.
79 Watt, T. T., Collector of Customs, Flinders Island.—Rock Crystal, from Flinders Island.

GROUP 2.—*Chemical and Metallurgical Products and Processes.*

80–1 Paterson, F. J., Hobart Town.—Metallic Silver, weighing 3 ozs. 5 drs. Nitrate of Silver, weighing 4 ozs. These have been recovered from Photographic Waste. For Sale.
82 Huston, Dr., New Norfolk.—Oil, distilled from Blue Gum Leaves at New Norfolk Asylum.
83–87 Weaver and Co., Elizabeth-st., Hobart Town.—Oils, distilled from Blue Gum Leaves, White Gum (Eucalyptus viminalis), Peppermint Gum-tree (Eucalyptus amygdalina), Sassafras Leaves, Oyster Bay Pine (Frenela). (See Supplement.)

Class II.—Animal Products.

GROUP 1.—*Wool, Hair, Skins, Furs, Silk, Feathers, Hoofs, Horns, Bones, Guano, Shells.*

88 Callow, James, Hobart Town.—Silk, in Skeins. The produce of 4000 Worms fed upon Mulberry Leaves.
89 Jhonson, Mrs., Hobart Town.—Silk, in Skeins. The produce of Worms fed on Mulberry Leaves.
90 Bolter, Alfred, Hobart Town.—Silk, in Skeins. The produce of Worms fed on Lettuces.
91 Hinsby, Mrs., Hobart Town.—Silk, in Cocoons. The produce of Worms fed on Mulberry Leaves.
92 Callow, James, Hobart Town.—Floss Silk. The Waste from No. 88.
93 Jhonson, Mrs., Hobart Town.—Floss Silk. The Waste from No. 89.
94 Gaunt, Mrs., Launceston.—Silk, prepared at the Servants' Home. Two Specimens.
95 M'Arthur, Charles, Launceston.—Sample of Cocoons. Grown and Dried according to Martelli's Rule.
96 Notman, W., Launceston.—Stuffed Tasmanian Birds. 27 Specimens.
97 Hissey, W., Hobart Town.—Thirty-three Varieties of Tasmanian Birds. Stuffed and Mounted by Exhibitor.
98–9 Elliott, G. H., Hobart Town.—Sable Opossum Rug, Grey Opossum Rug.
100 Gould, C., Hobart Town.—Rug made from Skin of Ring-tailed Opossum.
101 Gould, C., Hobart Town.—Rug made from Skin of Sable Opossum.
102 Elliott, G. H., Anglesey Tannery, Hobart Town.—Wallaby Rug.
103 Elliott, G. H., Hobart Town.—Devil Skin Mats (Dasyurus Ursinus).
104 Elliott, G. H., Hobart Town.—Tiger Skin (Thylacinus Cynocephalus).
105 Tarleton, Wm., Sandy Bay.—Tiger Skin, with Head and Feet complete.
106 Elliott, G. H., Hobart Town.—Imitation Leopard Skin.
107 Boyd, J., Port Arthur.—Kangaroo Skins (Macropus).
108 Boyd, J., Port Arthur.—Wallaby Skins.
109 Gould, C., Hobart Town.—Two Forester Kangaroo Skins, Tanned.
110–111 Gould, C., Hobart Town.—Brush Kangaroo Skin; two do., young animals.
112 Elliott, G. H., Anglesey Tannery, Hobart Town.—Four Buck Skins.
113 Horne, A. J., Palmerston.—One Bundle Sable Opossum Skins.
114 Boyd, J., Port Arthur.—Opossum Skins (Phalangista Fuliginosa).
115 Boyd, J., Port Arthur.—Kangaroo-rat Skins.
116 Boyd, J., Port Arthur.—Porcupine or Hedgehog Skin.
117–18 Boyd, J., Port Arthur.—Native Cat Skin, Dark (Dasyurus Viverrinus); Ditto, Grey (Dasyurus Mougei).
119–21 Gould, C., Hobart Town.—Two Bandicoot Skins, Ring-tailed Opossum Skins, Grey Opossum Skins.
122 Notman, W., Launceston.—Native Hyena (Thylacinus Cynocephalus).
123 Notman, W., Launceston.—Iguana (Cyclodus Negrolutens), Stuffed.
124 Elliott, G. H., Hobart Town.—Leicester Wool Mats.
125 Meredith, John, Cambria.—One Fleece Wool.
126 Murray, Wm., Hobart Town.—One Fleece Wool.
127–28 Horne, A. J., Palmerston.—Buck's Head and Antlers (Cured with Arsenic).
129 Price, Charles, Launceston.—Five Boxes from Sperm Whales' Teeth.
130 Boyd, J., Port Arthur.—Mussel Shells, Port Arthur.
131 Boyd, J., Port Arthur.—Mutton Fish Shells. The Aborigines used these Fish as Food, and made Armlets, &c., of the Shells.
132 Chapman, I. E., Hobart Town.—Guano, Bird Island. Largely used as a Manure in Tasmania, with great advantage. For Sale.

GROUP 2.—*Meat, Fish, Fowl, whether Salted, Dried, Smoked, or Preserved; Gelatine, Isinglass, Milk, Butter, Cheese.*

133 M'Cracken, R., Hobart Town.—Preserved Beef. Some of this Beef has been two or three voyages in a whaling vessel. Some made in 1861 and 1862.
134 Adcock, G., Liverpool-st., Hobart Town.—Preserved Meats, twelve months old.
135 Russell, R. and W., Liverpool-street.—Two Hams. Cured by G. Adcock, Hobart Town.
136 Crouch, Mrs.—One tin Kangaroo Soup, preserved by exhibitor.

137 Crouch, Mrs.—Two packages Kangaroo Sausages, preserved by exhibitor.
138 Crouch, Mrs.—Kangaroo Jugged, preserved by exhibitor; first experiment.
139 Crouch, Mrs.—Two tins Kangaroo Steamer, preserved by exhibitor.
140 Crouch, Mrs.—Two Kangaroo Hams, preserved by exhibitor.
141 Crouch, Mrs.—Kangaroo Tails. Two tails for soup.
142 Murray and Murdoch, Hobart Town.—Cheese.
143 Russell, R. and W., Liverpool-street.—Two Cheeses from Mr. Woodbury, Cullenswood.
144 Boyd, J., Port Arthur.—Gelatinous Sea-weed. This sea-weed yields by boiling a straw-coloured jelly fit for the table.
145 Adcock, George, Liverpool-street, Hobart Town.—Bladder of Lard.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

GROUP 1.—*Cereals, Agricultural Seeds, Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

146 Shoobridge, E., New Norfolk.—Hops. Two packets grown at Valleyfield.
147–8 Lindley, G. W., Jericho.—Wheat, weighing 67 lbs. to the bushel. Grown at Valleyfield.
149 Wilson, G., Oatlands.—Wheat.
150 Boyd, J., Port Arthur.—Wheat (Hallet's).
151 Littlechild, T., Oatlands.—Wheat (Farmers' Friend).
152–3 Hadden, J., Green Ponds.—Wheat.
154 Beveridge, W., Hagley.—Wheat (White Velvet).
155–6 Gaunt and Co., Launceston.—Two bushels of Wheat.
157 Walker, Robert, Mayor of Hobart Town.—A bushel of Wheat.
158–160 Cresswell, C. F., Hobart Town.—One bushel Wheat, White Laumac; ditto, White Tuscan; ditto, Red Tuscan.
161–2 Cresswell, C. F., Hobart Town.—Wheat, Goldsmith; ditto, May's Prolific.
163 Dean, W. M., Launceston.—Barley, weighing 58 lbs. 1 oz. to the bushel.
164 Littlechild, T., Oatlands.—Barley (Golden Italian).
165 Hadden, J., Green Ponds.—Barley.
166 Dean, W. M., Launceston.—One bushel of Barley, 57 lbs. 8 ozs. to the bushel.
167–9 Cresswell, C. F., Hobart Town.—Oats, Poland, White Tartarian, Potato.
170 Dodery, W., Longford.—Oats, grown at Bishopbourne in 1864. Average height of crop, 7 feet; produce, 100 bushels per acre.
171 Littlechild, T., Oatlands.—Oats, Poland.
172 Wilson, G., Oatlands.—Oats.
173 Williatt, John, Evandale.—Two boxes Potato Oats, produced originally from ten grains.
174 Dean, W. M., Launceston.—One bushel Oats.
175–6 Horne, A. J., Palmerston.—Three bushels Tartarian Oats; three bushels Potato Tartarian Oats.
177 Cresswell, C. F., Hobart Town.—Rye.
178 Glover, Miss, Sorell.—Rye-Grass Seed.
179–80 Cresswell, C. F., Hobart Town.—Rye-Grass Seed; ditto, Perennial, weighing 35 lbs. to the bushel.
181–6 Cresswell, C. F., Hobart Town.—Canary Seed, Carraway Seed, Coffee Peas, Flax Seed, Golden Tares, Grey Tares.
187 Murray, W., O'Brien's Bridge.—Beans.
188 Hogarth, T., Breadalbane.—One bushel Beans.
189 Hogarth, T., Breadalbane.—One bushel Grey Peas.
190 Cresswell, C. F., Hobart Town.—Cocksfoot Grass Seed.
191 Cresswell, C. F., Hobart Town.—Sanfoin Grass Seed.
192 Cresswell, C. F., Hobart Town.—Indigenous Seeds of Tasmania.
193 Morrison, Askin, New Wharf.—Native Bread (Mylitta Australis). A fungus growing like a truffle underground.
194 Backhouse, R., Sandy Bay.—Flax.
195 Backhouse, R., Sandy Bay.—Fibrous Grass.

196 Boyd, J., Port Arthur.—Fibre of Stringy-bark. Supposed to be useful for coarse paper-making.

197–206 Boyd, J., Port Arthur.—Fibre of Currijong. Fibre of Cutting Grass. Bark of the various indigenous trees. Native Pepper (the Tasmanian Fragrans), in bottle. Seven Veneers, each containing five species of wood. Charcoal from Blue Gum, Stringy Bark, Sheoak, and Peppermint.

207 Whitefoord, Miss, Launceston.—Algæ of Tasmania, in Portfolio.

208 Fereday, Mrs., George Town.—Algæ of Tasmania, in Portfolio.

209 Falconer, W. R., Hobart Town.—Blackwood, slab polished (Acacia melanoxylon). This wood is valuable for cabinet work and staves for casks. When washed with limewater it becomes as dark as American Rosewood, and is equally hard and heavy.

210–18 Boyd, J., Port Arthur.—Blackwood, root, knees-shaped; ditto, circular shape; ditto, Staves; ditto, Root, 60 x 24 x 4; ditto, 48 x 18 x 4; ditto, 36 x 12 x 5; ditto, 36 x 14 x 4; ditto, Plank, 144 x 20 x 4; ditto, Shingles.

219 Douglas, Adye, Launceston.—Blackwood (Acacia melanoxylon), Plank. A magnificent slab.

220 Boyd, J., Port Arthur.—Blue Gum, figured, 82 x 28 x 5. Said to be equal to oak for ship-building; and may be obtained in any length of plank or log up to 200 feet long.

221–4 Boyd, J., Port Arthur—Blue Gum, Trenails; do., Flooring Boards; do., Baulk; do., Plank, 12 feet x 48 x 6.

225 Gunn, Ronald C., Newstead.—Three pieces Scented Wood (Alyxia buxifolia).

226 Gould, C., Hobart Town.—Specimens Scented Wood, from North-east Coast.

227 Scott, James R., Launceston.—Three planks Celery Top Pine, from Ringarooma, where large beds are found of this timber.

228 Boyd, J., Port Arthur.—Celery Top Pine, 120 x 12 x 5 (Phyllocladus Asplendifolia). This timber is remarkably tough.

229 Boyd, J., Port Arthur.—Cherry Tree, 60 x 7 x 8 (Exocarpus cupressiformis). This wood is used for inlaid cabinet work, gun-stocks, axe-handles, &c.

230–1 Boyd, J., Port Arthur.—Dogwood Root, 24 x 24 x 3 (Bedfordia salicifolia). This is usually a beautifully veined wood, and takes a high polish. Do., 42 x 7 x 6.

232 Hall, C. W., Huon Road.—Musk-wood, slab (Eurybia Argophylla). Used for cabinet work, picture frames, and wood turnery. The timber can be procured in pieces sufficiently large for all ordinary purposes, and is usually beautifully veined and marked.

233–5 Rout, W., New Town.—Musk-wood Slabs, polished.

236 Hooper, G., Hobart Town.—Musk-wood root slab, polished.

237–42 Boyd, J., Port Arthur.—Musk-wood, figured, 36 x 24 x 3; ditto, 36 x 16 x 3; ditto, 24 x 22 x 4; ditto, 38 x 20 x 2; ditto, 22 x 8 x 3½; ditto, 24 x 12 x 6.

243 Hurst, J. R., Launceston.—Tasmanian Woods (six specimens): Myrtle, Musk-root, Musk-stem, Cabbage Musk, Huon Pine, and Pink-wood.

244–7 Boyd, J., Port Arthur.—Musk, figured, 39 x 22 x 3; ditto, 34 x 24 x 6; ditto, 24 x 18 x 4; ditto, 32 x 18 x 4.

248–9 Boyd, J., Port Arthur.—Sheoak Wood, 112 x 12 x 4½. Casuarina quadrivalvis, commonly used for firewood; but where well veined it forms a good cabinet timber, taking a high polish. Ditto, 70 x 10 x 3½.

250 Pitt, Wm., Sandy Bay.—Sheoak.

251 Boyd, J., Port Arthur.—Heoak (Casuarina stricta), 60 x 12 x 3. Used for cabinet work.

252–3 Boyd, J., Port Arthur.—Silver Wattle (Acacia dealbata), plank, 120 x 12 x 4. The bark is used for tanning, the timber for trenails and casks, and the gum is equal to gum arabic. Ditto, Staves.

254–6 Boyd, J., Port Arthur.—Sassafras (Atherosperma moschata), plank, 126 x 9 x 3. The timber is used in cabinet work, ship fittings, carpenters' tools, &c.; the bark is medicinal and highly aromatic. Ditto, Gig Whip Handles. Ditto, root.

257–60 Boyd, J., Port Arthur.—Stringy Bark (Eucalyptus gigantea), flooring boards; the timber is used for heavy building purposes, and the young saplings for poles; the bark is said to be useful in coarse paper-making. Ditto baulk, 14 feet x 24 x 18 inches; ditto plank, 12 feet x 45 x 6 inches; ditto shingles.

261 Boyd, J., Port Arthur.—Peppermint (Eucalyptus), plank, 10½ feet x 24 feet 6 inches. Used for fencing and house timber.
262 Boyd, J., Port Arthur.—Peppermint shingles.
263 Boyd, J., Port Arthur.—Shingles, gum.
264 Boyd, J., Port Arthur.—Prickly Wattle (Acacia verticillata). A graceful flowering shrubby tree.
265 Boyd, J., Port Arthur.—Native Pepper Wood (Tasmania Fragrans), 48 x 6 x 3.
266-73 Boyd, J., Port Arthur.—Figured Myrtle (Fagus Cunninghamii), 35 x 15 x 4; the timber is used in cabinet work, and takes a high polish. Ditto, 24 x 24 x 3; ditto, knot; ditto, 49 x 18 x 5; ditto, 49 x 29 x 5; ditto, 24 x 24 x 5; ditto, circular shaped; ditto, plank.
274 Boyd, J., Port Arthur.—White Wood (Pittosporum). Supposed to be a fit wood for carving and engraving. The Aborigines made waddies of it.
275 Boyd, J., Port Arthur.—Narrow leaf Tea Tree, 64 x 16 x 6.
276 Boyd, J., Port Arthur.—Broad leaf Tea Tree, 56 x 14 x 14.
277 Boyd, J., Port Arthur.—Pink Wood, 51 x 7 x 6. Ditto, Croton. Used for sheaves for blocks, musical instruments, &c.
278-9 Boyd, J., Port Arthur.—Ironwood, 36 x 26 x 6. Notelia ligustrina. Used for mallets, ships' blocks, and turnery. Ditto, 168 x 14 x 4.
280 Boyd, J., Port Arthur.—Native Pear Tree, 72 x 6 x 6.
281 Boyd, J., Port Arthur.—Native Box Wood, 43 x 9 x 6. Bursaria spinosa.
282 Boyd, J., Port Arthur.—Honeysuckle Wood, 60 x 15 x 8. Banksia Australis. The bark used for tanning, the timber for cabinet work.
283 Boyd, J., Port Arthur.—Native Laurel Wood, 118 x 5 x 5. Anopterus glandulosa. Used for cabinet work.
284 Boyd, J., Port Arthur.—Norfolk Island Yellow Wood, 9 x 12 x 4.
285-6 Boyd, J., Port Arthur.—White Gum Baulk, 14 feet x 24 x 18 inches. Eucalyptus resinifera. Used for house timbers, shingles, laths, &c. Ditto, plank, 12 feet x 45 inches x 6.
287 Boyd, J., Port Arthur.—Laths.
288 Hood, R. L., Hobart Town.—Huon Pine Wood (a polished block of).
289 Hood, R. L., Hobart Town.—Rosewood Veneer, from Marlborough, polished to show the grain.
290-1 Cotton, F., Swanport.—Oyster Bay Pine (Callitris Australis). Used for agricultural implements, house flooring, &c. Ditto, Saplings.
292 Dyer, R. B., Hobart Town.—Gordon River Pine. A very light pine, used in making oars and sculls.
293 Boyd, J., Port Arthur.—Hop Poles, 20 feet long.
294 Boyd, J., Port Arthur.—White Willows.
295 Boyd, J., Port Arthur.—Fancy Walking Sticks.
296-7 Boyd, J., Port Arthur.—Gum Palings, 6 feet long. Ditto, 5 feet long.
298 Belbin and Dowdell, New Wharf.—Palings, a bundle.
299 Belbin and Dowdell, New Wharf.—Laths, a bundle.
300 Belbin and Dowdell, New Wharf.—Shingles, a bundle.
301 Boyd, J., Port Arthur.—10 Table Tops, 100 feet run.
302 Boyd, J., Port Arthur.—30 Tressels, 3 feet 6 inches high. Made at Port Arthur for use in the Exhibition Building in Victoria.
303 Abbott, John, Rookwood.—Hortus Siccus, of Flowers gathered in July, 1866.

GROUP 2.—*Flour; Meal, of every Variety and in every Form; Malt, Starch, Gluten, Sago, Tapioca, Arrowroot, Sugar, Confectionery.*

304 Gibson, William, Hobart Town.—Flour. Manufactured at the Franklin Wharf Steam Mills.* For Sale.
305 Murray, William, O'Brien's Bridge.—Flour. Manufactured at the Houghton Steam and Water Mills.
306 Harrap, Alfred, Emerald Mills, Launceston.—Flour, silk dressed (2 bags).
307 Noakes, Mrs., Longford.—Flour.
308 Green, William, Old Wharf.—Flour
309 Walker, Robert, Mayor of Hobart Town.—Flour.
310 Gaunt and Co., Launceston.—Flour.
311 Brown, D., Brewer and Malster, Green Ponds.—Malt. For Sale.
312 Walker, Robert, Mayor of Hobart Town.—Malt.

313 Finlayson, A. H., Hobart Town.—Cabin Biscuits, two cases. Made by Exhibitor.

314 Finlayson, A. H., Hobart Town.—Water Biscuits (or Crackers). For Sale.

315–326 Daley, Patrick, St. Leonard's.—Biscuits (tin of each)—Water Crackers, Cracknells, Spice Nuts, Arrowroot, Derby, Pic-nic, Lemon Drop, Shrewsbury, Coffee, Cheese, Lemons, Pavellions.

GROUP 3.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Jams, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

327 Bulman, James, Ringarooma.—Potatoes grown at Ringarooma; second year's crop off same land.

328 Jhonson, Mrs., Hobart Town.—Pears, Modelled in Wax by Mrs. Jhonson from Fruit selected by the Commissioners, and Exhibited on Mosses gathered from the Myrtle and Sassafras Trees on Mount Wellington by Hugh H. Hull. Seven Varieties.

329 Jhonson, Mrs., Hobart Town.—Apples, Modelled in Wax by Mrs. Jhonson from Fruit selected by the Commissioners, and Exhibited on Mosses gathered from the Myrtle and Sassafras Trees on Mount Wellington by Hugh M. Hull. Thirty-one Varieties.

330 Jhonson, Mrs., Hobart Town.—Oranges, Modelled in Wax by Mrs. Jhonson from Fruit grown in open air at Royal Society's Gardens. Three Varieties.

331 Jhonson, Mrs., Hobart Town.—Pomegranates, Modelled in Wax from Fruit grown in open air at Royal Society's Gardens.

332 Hall, Miss Victoria, and Morgan, Miss Emily, Hobart Town.—Tasmanian Native Flowers, Modelled in Wax. Twenty-four Varieties. Modelled from Nature by Exhibitors. For Sale.

333 Forster, J., Hobart Town.—Tasmanian Native Flowers. Modelled from Nature by Miss Rachel Olding. For Sale.

334 Marshall, John, New Town road.—Apples. Nine Varieties.

335 Marshall, John, New Town road.—Pears. Six Varieties.

336 Moore, Dr., New Norfolk.—Wine, 1865. Made from the Muscatel Grape.

337 Hopkins, H., jun., New Town.—Wine from Grapes.

338 Mezger, J., New Town.—Wine from Grapes.

339 Dean, W., New Norfolk.—Wine. Made in 1860 from the Sweetwater Grape.

340 Murray, W., O'Brien's Bridge.—Wine from Grapes.

341 Moore, Dr., New Norfolk.—Black Hamburg Wine, 1855. A thin acid wine, which will improve by age.

342 Mezger, J., New Town.—Gooseberry Wine.

343 Moore, Dr., New Norfolk.—Still Champagne Wine, two years old.

344 Moore, Dr., New Norfolk.—Groseille Wine, two years old, made from white Gooseberries.

345 Meredith, J., Cambria.—Black Currant Wine.

346 Murray, W., O'Brien's Bridge.—Small-fruits Wine.

347 Murray, W., O'Brien's Bridge.—Cherry Wine.

348 Mezger, J., New Town.—Mulberry Wine.

349 Mezger, J., New Town.—Plum Wine.

350 Tame, Joseph, Launceston.—Gooseberry Wine. Six Bottles, made in 1864 and 1865.

351-4 Hedger, George, Launceston.—Gooseberry, Grape, Cherry, and Plum Wine.

355 Brumby, Mrs., Longford.—Wines. Made by Exhibitor.

356-7 Russell, W., Perth.—Grape and Sherry Wine. Made by Exhibitor.

358 Button, W. S., Launceston.—Grape Wine. Six Bottles, made by Exhibitor.

359-64 Lipscombe, Edward, Sandy Bay.—Mulberry, Gooseberry, Red Currant, Black Currant, Cherry, and Elderberry Wine. From the Produce of his own Nursery Garden.

365 Paterson, John, Hobart Town.—Cordial, Cloves. Manufactured by Exhibitor.

366 Paterson, John, Hobart Town.—Peppermint Cordial. Manufactured by Exhibitor.

367 Meredith, J., Cambria.—Raspberry Vinegar.

368 Lipscombe, Edward.—Three Bottles White Vinegar, from Gooseberries.

369 Lipscombe, Edward.—Three Bottles Brown Vinegar, from Gooseberries.

370 Noakes, Mrs., Longford.—Cask Malt Vinegar. Manufactured by Exhibitor.

371 Russell, W., Perth.—Mead.
372–3 Wilson, Hon. J. M., Cascade Brewery.—Barrel Ale. Case Bottled Ale.
374 Noakes, Mrs., Longford.—One Cask Ale. Made from Colonial Malt and Hops.
375 Wilson, Hon. J. M., Hobart Town.—One barrel Ale, brewed at the Cascades Brewery.
376 James, W., Hobart Town.—Porter. Manufactured by Mr. James at Elizabeth-street Brewery.
377 Walker, R., Hobart Town.—One barrel of Ale. Manufactured by Mr. Walker at Barrack-street Brewery.
378 Lyne, W., Swanport.—Cider. Made by Mr. Lyne in season 1866.
379 Mezger, J., New Town.—Cider. Made by Mr. Mezger in season 1865.
380-1 Adcock, George, Liverpool-street, Hobart Town.—Neat's-foot and Sheep's-foot Oil.
382–4 Bulman, James, Ringarooma. Three Samples Potash, made according to Sir W. Denison's instructions.
385 Howden, A., Launceston.—Japan Ink.
386 Meredith, J., Cambria.—Mushroom Ketchup.
387 Lowes, Hon. T. Y., Glenorchy.—Dried Plums (1864).
388 Button, W. S., Launceston.—One Bottle Plums.
389 Dickenson and Co., Hobart Town.—Five Tins Orange Marmalade.
390 Lipscombe, Edward, Sandy Bay.—Five Tins Orange Marmalade.
391–402 Allport, Mrs., Hobart Town.—Lemon Marmalade, Strawberry Jam, Raspberry Jam, Gooseberry Jam, Black Currant Jam, Green Gage Jam, Morella Cherry Jam, Siberian Crab Jelly, Berberry Jam, Peach Jam, Mulberry Jam, Cape Gooseberry Jam.
403–423 Dickenson and Co., Hobart Town.—These Jams are in the state in which Dickenson and Co. export them to the neighbouring Colonies. One Jar Raspberry Jam, Five Tins Red Currant Jam, One Jar Red Currant Jam, Five Tins Black Currant Jam, One Jar Black Currant Jam, Five Tins Apricot Jam, One Jar Apricot Jam, Five Tins Damson Jam, Five Tins Damson Jam in Jar, Orleans Plum Jam, Green Gage Jam, Five Tins Yellow Gage Jam, One Jar Yellow Gage Jam, Five Tins Blue Gage Jam, Five Tins Egg Plum Jam, Five Tins Gooseberry Jam, Two Jars Gooseberry Jam, Five Tins Strawberry Jam, Two Jars Strawberry Jam, Two Jars Nectarine Jam.
424 Hull, Mrs. H. M., Hobart Town.—Quince Preserve. Cost, 5d. per pound.
425–27 Huston, Dr., New Norfolk.—Two Jars Carrot Jam, Two Jars Mangold Wurzel Jam, Two Jars Parsnip Jam. Manufactured at the Lunatic Asylum without Sugar.
428–9 Dickenson and Co.—Two Jars Orange Marmalade, Two Jars Prunes.
430 Stewart, Robert, Launceston.—Six Dozen Tins Orange Marmalade.
431–454 Lipscombe, Edward, Sandy Bay.—Black Currant Jam, White Currant Jam, Apricot Jam, Green Gage Jam, Orleans Plum Jam, British Queen Strawberry Jam, Keen's Seedling Strawberry Jam, Washington Plum Jam, Magnum Bonum Plum Jam, Yellow Gage Jam, Damson Jam, Mulberry Jam, Peach Jam, Raspberry Jam, Cherry Jam, Gooseberry Jam, Quince Jam, Red Currant Jam, Raspberry Jelly, Quince Jelly, Black Currant Jelly, Red Currant Jelly, Cherry Jelly, Apple Jelly.
455 Creswell, C. F., Murray-street, Hobart Town.—Jams.
456–7 Huston, Dr., New Norfolk.—Parsnip Treacle, 2 bottles; Carrot Treacle, 2 bottles. Manufactured at the Lunatic Asylum.
458 Huston, Dr., New Norfolk.—Mangold Wurzel Treacle, 2 bottles. Manufactured in the Lunatic Asylum.
459 Abbott, Hon. E., Bellerive.—Onions, pickled, [illegible] bottles.
460 Meredith, John, Cambria.—Almonds, grown at Cambria, Swanport.
461 Scott, James. Launceston.—Almonds, two bags.
462-3 Meredith, J., Cambria.—Filberts, Walnuts.
464 Scott, James, Launceston.—Acorns.

Class IV.—Manufactures and the Useful Arts.

GROUP 1.—*Porcelain, Pottery, Glass, Iron, Hardware, Cutlery, Wickerwork.*

465-7 Wignall, W., Hobart Town.—Waste Paper Basket, Marketing Basket, Clothes Basket. For Sale.

468–472 Boyd, J., Port Arthur.—White Clay Bricks, Red Clay Bricks, Large Drain Tiles, Small Drain Tiles, Fireplace Hobs.
473 Howden, A., Launceston.—Furnace Fire Bricks, laid with Seymour fire-clay.
474 Nicolson, J., Camelford.—Firebricks and Clay.
475 Howden, A., Launceston.—Pocket Filter for the bush.
476 Howden, A., Launceston.—Model of Gas Purifier.
477 Toby, C., Seymour Coal Company.—Fire Bricks.
478 Beecroft, W., jun., Launceston.—Carriage Horse Shoes.
479–482 Beecroft, W., sen., Launceston.—Hack Horse Shoes, Plates (set of), Bar Shoe, Convex Shoes (set of).
483 Davies, J., Launceston.—Horse Shoes. Made by Exhibitor.

GROUP 2.—*Leather, Bonedust, Animal Charcoal, Oils, Blood, Ammonia, Glue, Fat, Tallow, Stearine, Honey, Wax, Soap, Candles, Varnishes.*

484 Johnston, Thomas, Hobart Town.—Sperm Oil (Physeter catodon). Exported to England in large quantities.
485 Hedberg, O. H., Hobart Town.—Sperm Oil. Exported to England in large quantities.
486-7 Johnston, Thomas, Hobart Town.—Black Whale Oil (Balena mysticetus), Black Fish Oil.
488–9 Hedberg, O. H., Hobart Town.—Black Whale Oil; Spermaceti Whale Oil, commonly called head-matter, obtained from the cavity in the head of the Sperm Whale.
490 Johnston, Thomas, Hobart Town.—Spermaceti.
491 M'Arthur, John, Barque "Aladdin."—Spermaceti.
492 Meredith, John, Cambria.—Honey. Produced at Cambria, Swanport.
493 Scott, James, Launceston.—A Jar of Honey.
494 Keene, Mr., Brown's River.—Curry Powder. Manufactured by Exhibitor.
495 Mezger, J., New Town.—Bone Dust. Ground at New Town Bone Mills.
496 Donnelly, J., Green Ponds.—Racing Saddle. Made by the Exhibitor. For Sale.
497–504 Elliott, G. H., Hobart Town.—Leather, viz.—Horsehide, Black Calf, Kid, Black Kangaroo, White Kangaroo, White Buck Kangaroo, Black Kangaroo Kid, Kip. From Skins and Hides of Tasmanian production. Manufactured at the Anglesea Tannery.
505–6 Murray, W., O'Brien's Bridge.—Leather, viz.—Kip. Manufactured at the Houghton Tannery, O'Brien's Bridge.
507 Murray, W., O'Brien's Bridge.—Tallow Candles. Manufactured at the Murrayfield Soap and Candle Works.
508-9 M'Laren, J. B., Hobart Town.—Candles and Soap. Manufactured at the Establishment, Old Wharf.
510 Murray, W., O'Brien's Bridge.—Soap. Manufactured at O'Brien's Bridge.
511 Ridley, S., Launceston.—Box of Soap.
512 Wilson, W., Hobart Town.—Soap.
513 Bartley, Mrs. Theodore, Kerry Lodge.—Jar of Manna, with a Branch of the Tree from which it was produced.

GROUP 3.—*Fabrics in Silk, Wool, Cotton, Hair, Flax, Hemp, Thread, or Straw—Spun, Woven, Felted, or Laid—Plain or Mixed.*

514–522 Aldred, William, Hobart Town.—Lady's Ringlet Wig, Gentlemen's Dress Wigs (2), Plain Hair Bands (2), Long Pieces of Hair (2), Bows for the Back of the Head (2), Plait (on Combs) for Back Hair, Frizzetts (4), Beards and Mustachios (3), Mustachios (12). Manufactured by Exhibitor.
523–4 Robertson, James, Launceston.—Lady's Paletôt, Netted by a Scotch Lady from Opossum Fur, the Cuffs and Collars in Crochet-work of the same material; Gloves of same material.

GROUP 4.—*Articles of Clothing; Lace, Embroidery, Specimens of Native Workmanship.*

525 Chick, R., Hobart Town.—Basket, made by Aboriginal Women. Made of the Lepidospermum Gladiatum. These Baskets were used by the Aborigines in Fishing, &c.

526-30 Burgess, Mrs., Swansea.—Branch of Black Wattle in Flower; Branch of Blue Gum in Flower (Exhibited at the Paris Exhibition in 1855); Group of Tasmanian Flowers; Branch of Blue Gum in Flower; Branch of Wattle. All worked in Worsted. All for Sale.

531 Burgess, Mrs., Swansea.—Branch of Prickly Mimosa worked in Worsted. For Sale.

532 Cooley, Mrs., New Town.—Scripture Subject worked in Worsted. Worked by her daughter.

533 Sly, John, Liverpool-street, Hobart Town.—Boots, manufactured by John Sly. Three descriptions.

534 Dandridge, Mr., Oyster Cove.—Head Dresses, worn by the Aboriginal women at the Government-house Ball on Queen's Birthday.

535 Dandridge, Mr., Oyster Cove.—Shell Necklaces, worn by Aboriginal women.

536 Abbott, John, Hobart Town.—Bracelets worn by Aborigines. Cut out of the Mutton Fish shell by the Aborigines.

Class V.—The Ornamental Arts.

GROUP 1.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Engravings, Carvings.*

537 Dixon, Rev. John, Windermere.—Portrait, "Bishop Nixon." By Exhibitor.

538 Dingham, G., Hobart Town.—Oil Painting, "An Anchor." Copied from an Art Union prize. For Sale.

539 Roberts, H. L., Hobart Town.—Oil Painting, "Hobart Town," Painted by K. Bull, about twenty years ago. For Sale.

540 Hollings, Mr., Hobart Town.—Oil Painting, "Hobart Town." Painted by Gretten. For Sale.

541 The Commissioners for Tasmania.—Photographic Portrait, "William Lanney," the last of the Aborigines. Photographed by Charles Woolley, of Hobart Town. William is about 26 years old, and belongs to the Coal River Tribe.

542 The Commissioners of Tasmania.—Photographic Portrait, "Patty," or Cooneana (the tailed Opossum). She belongs to the Kangaroo Point Tribe, and is nearly 70 years old.

543 The Commissioners of Tasmania.—Photographic Portrait, "Wapperty," or Wonoteah Cootamena (Thunder and Lightning). Wapperty is nearly 70 years old. She belongs to the Benlomond Tribe.

544 The Commissioners of Tasmania.—Photographic Portrait, "Lallah Rookh," or Truganini (Seaweed). Lallah Rookh is about 65 years old. She belongs to the Bruni Island Tribe.

545 The Commissioners of Tasmania.—Photographic Portrait, "Bessy Clarke," or Pinnanobathac (Kangaroo Head). Bessy is about 50 years old. She belongs to the Macquarie Harbour Tribe.

546 The City Council of Hobart Town.—Photographic Plate of Public Buildings in Hobart Town, with Statistics of the City and Corporation; and copies of the old and present Seals of the Colony.

547 The Town Council of Launceston.—Public Buildings and other Buildings in Launceston.

548 Fogg, Miss S. A., George Town.—Painting, "Sybil," from Guercino.

549 Fogg, Miss S. A., George Town.—Painting, "The Singing Lesson," from Nescher.

550 Feraday, Mrs., George Town.—Native Flowers of Tasmania. Painted by Exhibitor.

551 Piguenit, W. C., Hobart Town. Mr. Piguenit is a native of Tasmania, and an Officer in the Civil Service.—Water Colour Drawing, "Prince of Wales Bay."

552 Dinham, G., Hobart Town.—Water Colour Drawing, "Sandy Bay." For Sale.

553 Dinham, G., Hobart Town.—Water Colour Drawing, "St. Helena Point." For Sale.

554 Burgess, Miss, Hobart Town.—Water Colour Drawing, "Rocks at Brown's River."

555 Burgess, Miss, Hobart Town.—Water Colour Drawing, "Fern-tree Valley." (In Gold Frame.) For Sale.

556 Burgess, Miss, Hobart Town.—Water Colour Drawing, "Fern-tree Valley."
557 Burgess, Miss, Hobart Town.—Water Colour Drawing, "Norfolk Island."
558 Burgess, Miss, Hobart Town.—Water Colour Drawing, "Landing Place, Norfolk Island."
559 Burgess, Miss, Hobart Town.—Water Colour Drawing, "Landscape in Tasmania."
560 Blyth, Miss, Claremont House.—Book of Water Colour Drawings, "Tasmanian Flowers." For Sale.
561 Gould, C., Hobart Town.—Water Colour Drawing of Hobart Town. Painted by Gretton. For Sale.
562 Crouch, Mrs.—Crayon Drawing, "The Ferry." Drawn by Mrs. Crouch's daughter.
563–569 Meredith, Mrs. Charles, Hobart Town.—Sketches of Tasmanian Scenery: "Valley of the Derwent," "Twamley," "Birch Grove, near Evandale," "Valley of Derwent," "Corra Linn, near Launceston;" "View from Government House." Painted by Exhibitor
570 Clifford, Samuel, Hobart Town.—Franklin Statue, Photograph.
571 Clifford, Samuel, Hobart Town.—Photographic Plates of Scenery and Public Buildings in the Rural Muncipalities.
572 Bolter, Alfred, Hobart Town.—Governor Davey's Proclamation to the Aborigines, 1816.
573 Spurling, S., Murray-st.—Photographic Portraits of Tasmanian Children.
574 Stuart, W. J., Murray-st.—Photographic Portraits of Tasmanian Artisans and others.
575 Abbott, John, George-st.—Water Colour Drawing of the *locale* of the Coal at Rookwood, D'Entrecasteaux Channel.
576 Easther, F., Launceston.—Carriage Drawings and Coats of Arms.
577 King, T. F., Circular Head.—View of Circular Head, Tasmania.
578 Walch and Sons, Hobart Town.—Tasmanian Postage Stamps and Bill Stamps.
579 Button, H., Launceston.—Stereotype, as practised at thu *Launceston Examiner* Office.
580–2 Price, Charles, Launceston.—Pattern, by eccentric drill; ditto, by elliptical cutter; ditto, worm on surface.
583 Allport, Morton, Holbrook Place.—Stereoscopic Illustrations of Tasmanian Scenery. By Exhibitor.
583*a* Dease, E. F.—"The Gamekeeper's Companion." S. Murray.
584 Allport, Morton, Holbrook Place.—Revolving Stereoscope, with 30 illustrations of Tasmanian Scenery. By Exhibitor.
585 Clifford, Samuel, Hobart Town.—Stereoscope, with 100 slides of Tasmanian Scenery.
586 Jarman, Richard, Murray-street.—Specimens of Copper-plate and Steel Engraving.

GROUP 2.—*Plate, Jewellery, Working in Metals.*

587 Crouch, Sarah, Hobart Town.—Topazes, from Flinders Island.
588, 589 Abbot, Francis, Hobart Town.—Two Skeleton Clocks. For Sale.

GROUP 3.—*Furniture and Decorations.*

590 Joscelyne, Samuel, Launceston.—Flower Stands of the Stem of the Fern Tree.
591 Hamilton, William, Elizabeth-st., Hobart Town.—Lady's Work Table of Colonial Woods. Made by Exhibitor.
592 Nicholas, Alfred, Hobart Town.—Hat Stand, made of Fern Tree Wood and Deer Horns.
593 Waldron, John, Launceston.—Two Work Tables on Pillars of fancy Tasmanian wood.
595 Wood, John, Launceston.—Writing Desk, 22 sorts of Wood, 1470 pieces.
596 Collins, Miss, Hobart Town.—Table of Huon Pine, inlaid with Tasmanian Ferns.
597 King, Thos. F., Circular Head.—Workbox of Colonial Wood.
598 Powell, W., Turner, Hobart Town.—Basket, of Red Myrtle. The Fagus Cunninghami. For Sale.
599 Powell, W., Turner, Hobart Town.—Goblet, of Norfolk Island Pine Wood, Knot. The Araucaria excelsa. For Sale.
600 Powell, W., Turner, Hobart Town.—Cup of same. For Sale.
601 Powell, W., Turner, Hobart Town.—Tray, of Muskwood. For Sale.
602 Powell W., Turner, Hobart Town.—Table, of Muskwood. For Sale.

603 Powell, W., Turner, Hobart Town.—Three Vases, of Fern Tree Wood, turned. For Sale.
604 Powell, W., Turner, Hobart Town.—Seed Boxes, of Huon Pine. For Sale.
605 Powell, W., Turner, Hobart Town.—Tray, of Blackwood. For Sale.
606 A. C. Ryland, Hobart Town.—Walking Sticks, 11. For Sale.
607 Watt, T. T., Hobart Town.—Work Box, of Tasmanian Woods, inlaid. Made upwards of twelve years. By T. Dowling.
608 Hooper, George, Hobart Town.—Three Vases of Ferntree Wood, polished.
609 Hooper, George, Hobart Town.—Two Vases of Ferntree Wood, unpolished.
610 Hooper, George, Hobart Town.—Tray of Pink Myrtle, turned. For Sale.
611 Hooper, George, Hobart Town.—Tray of Muskwood, turned. For Sale.
612 Hooper, George, Hobart Town.—Set of Croquet Bats and Balls, turned; the balls of She-oak and Musk. For Sale.
613 Hooper, George, Hobart Town.—Myrtle; Turned Candlesticks. For Sale.
614 Hooper, George, Hobart Town.—Musk Wood; Turned Candlesticks, unpolished. For Sale.
615 King, T. F., Circular Head.—Reel Stand of Colonial woods.
616 King, T. F., Circular Head.—Flower Stand of Colonial woods.
617 King, T. F., Circular Head.—Pin Dish of Colonial woods.
618 King, T. F., Circular Head.—Candlesticks of Colonial woods.
619 Price, Charles, Launceston.—Watch Stand, Myrtle Wood.
620 Price, Charles, Launceston.—Watch Stand, Musk Wood.
621–622 Simpson, John, Launceston.—Two Fire Screens, of Black Wood.

GROUP 4.—*Printing, Stationery, and Bookbinding.*

623 Barnard, James, Government Printer.—Legislative Council Journals. Printed and bound at the Government Printing Office.
624 Barnard, James, Government Printer.—House of Assembly Journals. Printed and bound at the Government Printing Office.
625 Barnard, James, Government Printer.—Three Volumes of Tasmanian Statutes. Printed and bound at the Government Printing Office.
626 Just, T. C., Hobart Town.—Salmoniana. Bound by Walch and Sons; printed at the *Mercury* office.
627 Dickson, Bassett, Glen Ayr.—Poems. Mr. Dickson is the author of these Poems. Printed and published at the *Mercury* office; and bound by Walch and Sons, of Hobart Town.
628, 629 Calder, J. E., Surveyor-General.—Lands of Tasmania for Sale.

GROUP 5.—*Maps.*

630 Wilks, H. J., Launceston.—Map of Tasmania. Drawn by himself.
631 Gould, Charles, Government Geologist.—Map of Tasmania, geologically coloured as far as the survey has extended.
632 Calder, J. E., Surveyor-General.—Maps of Tasmania.
633 Toby, C.—Maps, showing the Seymour Coal Mine.

Class VI.—Machinery.

GROUP 2.—*Motive Machinery and Carriages.*

634-5-6 Boyd, J., Port Arthur.—Gig Shafts, Cart Wheels, Railway Sleepers.
637 Dyer, B. B., Hobart Town.—Pair of Oars. Made from Gum Woods.
638 Dyer, B. B., Hobart Town.—Pair of Sculls. Made from the Gordon River Pine. For Sale.
639 Easther, F., Launceston.—Self-acting Hose Reel.
640 Easther, F., Launceston.—Double Horse Break, with improved means of attachment.

GROUP 3.—*Agricultural and Horticultural Machines and Implements.*

641 Boutcher, A., Huon.—Plough. Mr. Boutcher claims to be the inventor. Attention is drawn to the head rack.
642, 645 Boyd, J., Port Arthur.—Plough Beam, Plough Handles, Keg, Bucket.
646 Wignall, W., Hobart Town.—Bucket. Made of White Myrtle. For Sale.
647 Wignall, W., Hobart Town.—Two Tubs.

648 Johnston, Thomas, Hobart Town.—Two Butter Tubs. Made of Wattle Wood. For Sale.

GROUP 4.—*Model of Vessel.*

649 Model of Vessel with Double Keel, giving large tonnage, great facilities for stowing, and light draught of water.

SUPPLEMENTARY.

Class I.—Mineral Products.

GROUP 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Lime, Cements, Clay, Salt.*

650 Wiggins, W., Stringybark-hill Quarry, Hobart Town.—One Cube Freestone.

GROUP 2.—*Chemical and Metallurgical Products and Processes.*

651–664 Weaver and Co., Chemists, Elizabeth-st., Hobart Town.—Spirit distilled from the Grass-tree (Xanthorrhœa Australis), rectified, 63° o.p., or 93 per cent. of alcohol; Picric Acid, from the Grass-tree; Gum Resin, from the Grass-tree; Dye, as shown by Wool dyed with colouring matter from the Grass-tree; French Polish, from the Grass-tree; Wood polished with above; Section of Grass-tree, from which the above preparations are made; Cod-liver Oil, from the Rock Codfish of Tasmania; Spirits of Wine; Granular Effervescent Seidlitz; Granular Effervescent Citrate of Iron; Granular Effervescent Citrate of Iron and Quinine; Granular Citrate of Magnesia; Solution of Bicarbonate of Magnesia and Acidulated Raspberry Syrup (from the fruit). Manufactured by Exhibitors.

665 Marrison, George, Launceston.—Essential Oils, distilled from the Blue Gum and Sassafras Leaves.

666–667 Howden, A., Launceston.—Ammoniacal Salts, in crude state; ditto, refined.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

GROUP 1.—*Cereals, Agricultural Seeds, Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

668 Wignall, W.—Willows, for Basket Making. These are largely used for basket making and for export.

669 Mitchell, Mrs., Lisdillon.—Resin, from the Oyster Bay Pine.

GROUP 2.—*Flour; Meal, of every Variety and in every Form; Malt, Starch, Gluten, Sago, Tapioca, Arrowroot, Sugar, Confectionery.*

670 Turner Brothers, Millers, Hobart Town.—Flour. Manufactured by Exhibitors.

671 Spencer and Wood, Hobart Town.—Malt. Manufactured by Exhibitors.

GROUP 3.—*Wine, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Jams, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

672 Hopkins, Henry, jun.—Lemons, grown at New Town Park, in open garden.

673 Wilson, Hon. Jas. M., Cascades.—Ale, brewed from Colonial Malt and Hops.

Class IV.—Manufactures and the Useful Arts.

GROUP 2.—*Leather, Bonedust, Animal Charcoal, Oils, Blood, Ammonia, Glue, Fat, Tallow, Stearine, Honey, Wax, Soap, Candles, Varnishes.*

674 Wilson, Wm., Harrington-street, Hobart Town.—Candles.

GROUP 4.—*Articles of Clothing; Lace, Embroidery, Specimens of Native Workmanship.*

675 Prescott, T., Murray-street, Hobart Town.—Worsted Work—"Happy Time;" worked by Miss Prescott, nine years old.

Class V.—The Ornamental Arts.

GROUP 1.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Engravings, Carvings.*

676 Piguenit, W. C., Survey Office, Hobart Town.—"Risdon."
677 Baily, Henry H., Elizabeth-st., Hobart Town.—Album Portraits.

GROUP 4.—*Printing, Stationery, and Bookbinding.*

678 Piesse, F. W.—"Essay on the History of Tasmania."
679 *Mercury* Newspaper, 3rd October, 1866.
680 *Tasmanian Messenger* Newspaper.

SECOND SUPPLEMENTARY.

Class I.—Mineral Products.

GROUP 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Lime, Cement, Clay, Salt.*

684 Abbott, John, of Rookwood, D'Entrecasteaux Channel.—Coal from Rookwood.

Class II.—Animal Products.

GROUP 1.—*Wool, Hair, Skins, Furs, Silk, Feathers, Horns, Hoofs, Bones, Guano, Shells.*

685-91 Elliott, George H., Anglesey Tannery, Hobart Town.—Bookbinder's Roans; Red Kangaroo Roans; Devil Skins (dasyurus ursinus); Black Kangaroo Kid Leather; Colonial Red Roans; Goat Skins; Grey Opossum Rug. Manufactured by Exhibitor.
692 Nichols, H. B., Longford.—Three samples of Wool.
693 Taylor, George, Patterdale.—Book containing samples of Wool.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

GROUP 1.—*Cereals, Agricultural Seeds, Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

694 Cresswell, C. F., Murray-street, Hobart Town.—Peas of the following descriptions:—Woodford's Dwarf Green Marrow, Prussian Blue, Blue Scimetar, Knight's Green Marrow, White Scimetar, Bedman's Blue Imperial, Fairbeard's Nonpareil, Early Charlton, Daniel O'Rourke, Wel-

lington, Champion of England, Napoleon or Climax, Early Emperor Early Kent, Veitch's Perfection, Hair's Dwarf Blue Mammoth, Burbridge's Eclipse, Payne's Conqueror, Advancer, Auvergne, Evergreen Surrey, Queen of the Dwarf, Great Eastern, Flack's Prolific, Creswell's Dwarf Marrow, Bishop's Dwarf, King of Marrows, Will Watch, Ne Plus Ultra, and Spider.

695-6 Cresswell, C. F., Hobart Town.—Beans; Barley, Cape.

697-8 Meredith, J., Hobart Town.—Peas, Grey; Wheat, Velvet.

699-702 Ayre, R. M'Kenzie, Esq., Launceston.—Oats, White Sandwich; Oats, White Tartarian; Oats, White Sheriff; Rye Grass, Perennial.

703 Lipscombe, F., Sandy Bay.—Indigenous Seeds.

GROUP 2.—*Flour; Meal, of every Variety and in every Form; Malt, Starch, Gluten, Sago, Tapioca, Arrowroot, Sugar, Confectionery.*

704 Ritchie, David, Scone Mills, Perth.—Oatmeal.

705 Wrainch, J., Hobart Town.—Confectionery. Manufactured by Exhibitor.

GROUP 3.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Jams, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

706-10 Grant, Mrs., Sandy Bay.—Pickles, two bottles Walnut; Sauces, two bottles Tomato, two bottles Ketchup; Jams, two pots Quince; Jelly, two pots Apple, two pots Red Currant; Raspberry Wine, three bottles. Manufactured by Exhibitor.

Class V.—The Ornamental Arts.

GROUP 1.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Engravings, Carvings.*

711 Meredith, Mrs. Charles, Hobart Town.—Sketches of Tasmanian Scenery: 1. Mount Wellington and part of Hobart Town, from road to Brown's River; 2. Two portions of the stone quarry at Prosser's Bay, now worked by Messrs. Glaister and Co., Melbourne; 3. "Cape Raoul" in 1856.

712 Meredith, Mrs. Charles, Hobart Town.—Twelve drawings of Tasmanian Flowers, Shrubs, Insects, &c. To these drawings the medal of the great London Exhibition of 1862 was awarded. 1. "Boobyala" (Acacia Sophoræ); Hair Trigger Flower (Stylidium Graminifolium); Lilac Daisy (Brachycome Scapifonnis); White Correa (Correa Reefa). 2. Great Red Lily (Blandfordia Grandiflora); Native Box Tree (Bursaria Spinosa); Purple Tassel Flower (Anthropodium Paniculatum). 3. Native Laurel (Anopterus Glandulosus). 4. Crimson, Pink, and White Epacris (Epacris Impressa); Myrtle-leaved Epacris (Epacris Myrtifolia). 5. Kangaroo Apple (Solanum Aricular); Prickly Tea Tree (Leptosperinum Scoparium). 6. Prickly Acacia (Acacia Verticillata); Native Indigo Plant (Indigofera Australis); Native Holly (Coprosma Cristella). 7. "A Cool Debate" (Tasmanian Gold Frogs on floating leaves of the native buck bean). 8. Thorny Coprosma (Coprosma Ritida); Cherry-fruited Aristolelia (Aristolelia Peduncularis); Thyme-leaved Decaspora (Decaspora Thymifolia). 9. Small-leaved Cyathodes (Cyathodes Parvifolia); Dagger-fruited Porcupine Plant (Hakea Pugioniformis); Walnut-fruited Porcupine Plant (Hakea Lissosperma); S-fruited Porcupine Plant (Hakea Epiglotis). 10. Native Pepper Plant (Tasmania Aromatica); Red Native Fuchsia (Correa Speciosa); Rough-leaved Tetratheca (Tetratheca Glandulosa). 11. White-flowered Grass Tree (Richea Drachophyllum). 12. Native Honeysuckle (Banksia Australis); Hairy Boronia (Boronia Polosa). By Exhibitor.

713 Clifford, Samuel, Liverpool-st., Hobart Town.—Photographic Plates of Private Residences. By Exhibitor.

714 Davidson, Mrs., Murray-st., Hobart Town.—Photographs of two Aboriginal Women.

715-16 Dease, Edward F., Launceston.—Oil Paintings: "The Gamekeeper's Companion," "St. François de Sale."

717 Dowling, Henry, Launceston.—Sketch in Oils (by the Artist, Mr. Robert Dowling, of Launceston) of his Picture of the Baptism of Christ.

718 Dowling, Henry, Launceston.—Life-size Portraits of their Royal Highnesses the Prince and Princess of Wales. Executed for Tasmania by Mr. Robert Dowling, in England.

719 Dowling, Henry, Launceston.—Busts, from life, of Woureddy and Tingernana, natives of Tasmania. By the late B. Law, of Hobart Town.

720 Nicholson, B. B.—Water-colour Drawings of T. S. N. Company's Screw Steamers "Derwent" and "Southern Cross."

721-2-3 J. C. C., Launceston.—Water-colour Drawings: View of the River Derwent and Government House, from the Queen's Battery, Hobart Town; View of the Derwent, from Government House; View of the Derwent, from the Waterworks. By Exhibitor.

724 Allport, Morton, Hobart Town.—Photographic Views (eight) of Tasmanian Scenery. By Exhibitor.

725 Mueller, Dr. (sent by his Excellency Colonel Gore Browne).—Sketch, showing Height and Circumference of Blue Gum Trees, Huon road. By F. Dunnett, Survey Department, Hobart Town.

GROUP 3.—*Furniture and Decorations.*

726 Thomas, T. W., Launceston.—Lady's Work Table (Tasmanian woods). By J. Wood.

Class V.—Ornamental Arts.

GROUP 4.—*Printing, Stationery, and Bookbinding.*

727 Hood and Manley, Hobart Town.—*Tasmanian Punch.* Exhibited by Proprietors.

728 Meredith, Mrs. Charles.—Glass Case containing her Works, in Prose and Verse, illustrated as follows:—1. "Notes and Sketches of New South Wales"—London: John Murray. 2. "My Home in Tasmania," 2 volumes—London: John Murray. 3. "Over the Straits"—London: Chapman and Hall. 4. "Some of my Bush Friends in Tasmania"—London: Day and Sons. 5. "Loved and Lost"—London: Day and Sons. 6. "Souvenir of Christmas Masques"—Hobart Town: 1866. 7. "Echoes of the Day"—Collected Poems on Local Subjects.

729 Walch and Sons, Messrs., Macquarie-street, Hobart Town.—Books and Specimens of Bookbinding.

GROUP 5.—*Maps.*

730 Calder, J. E., Surveyor-General.—List of Plans:—1. South-Western Approaches to the Port of Hobart Town (taken from Official Records), by J. E. Calder. 2. Illustrating Hobart Town, from 1806 to 1866, by F. Dunnett. 3. Illustrating Internal Communication, by W. C. Piguenit. 4. Illustrating Electoral Divisions, by L. W. Langley and Edward Ellis. 5. Illustrating Municipal Divisions, by L. W. Langley. 6. Showing Divisions of Property in an Inland County, by G. F. Lovett. 7. Launceston, by Albert Reid. 8. Alienated Property and Leased Crown Lands in the Island, by W. G. Piguenit. 9. Showing Recently-developed Good Land in Dorset, by J. R. Hurst. 10. Showing Recently-developed Good Land in Wellington, by R. Simmons. 11. Showing Recently-developed Good Land in Devon, by J. M. Dooley.

731 Calder, J. E., Surveyor-General.—Book of County Sheets, lithographed.

Class VI.—Machinery.

GROUP 3.—*Agricultural and Horticultural Machines and Implements.*

732 Home, A. J., Launceston.—Patent Sheep-washing Machine.

733 Thomas, David, Practical Farrier, Perth, near Launceston.—The "Guevile" Horse Shoeing Instrument. Invented and manufactured by Exhibitor.

GROUP 5.—*Miscellaneous.*

734 Parker, William, Launceston.—Three Paper Weights, marble and granite.
735 Hull, Hugh M. (Secretary to the Commission).—Bouquet of Wild Flowers and Mosses in glass, from Mount Wellington.

ADDENDA.

Class II.—Animal Products.

GROUP 2.—*Meat, Fish, Fowl, whether Salted, Dried, Smoked, or Preserved; Gelatine, Isinglas, Milk, Butter, Cheese.*

736 Allport, Morton, Hobart Town.—Salmon, two-year-old Smolt, caught in New Town Rivulet, Tasmania, twenty-five miles from where the Fry were turned out.

Class IV.—Manufactures and the Useful Arts.

GROUP 5.—*Miscellaneous.*

737 Elliott, G. B. B., River Cam.—Natural Curiosity. Park Seat—the back representing Water, Plains, Mountains, Sky, and Clouds. To be sold at close of Exhibition.
738 Abbott, John, Rookwood, Tasmania.—Book of Tasmanian Scraps, from an Australian native.

[Prices and Information respecting any of the Tasmanian Exhibits may be obtained from the Commissioners' Agents in Melbourne, Messrs. B. B. Nicholson and Co., Alfred Wilkins, Esq., or of Mr. William Russell Evans, Secretary Tasmanian Court, Exhibition Building.]

SOUTH AUSTRALIAN COURT.

[South Australian Court, Centre of West Side of Great Hall, adjoining New South Wales Court.]

AGRICULTURAL PRODUCE.

1–9 General Committee.—Nine Bags Wheat, Tuscan and Purple Straw varieties.
10 General Committee.—One Bag Tartarian Oats.
11 General Committee.—One Bag Riga Linseed.
12 Wells, Thomas, Mount Gambier.—One Bag Pedigree Wheat.
13 Smith, A., Mount Gambier.—One Bag Tuscan Wheat.
14–15 Wehl, E., Mount Gambier.—One Bag Prolific Wheat; One Bag Riga Linseed.
16–17 Bell, A., Mount Barker.—One Bag Tuscan and One Bag Purple Straw Wheat.
18 Griffin, Cant.—One Bag White Tuscan Wheat.

FLOUR.

19 Dawson, James, Gawler.—One Hundred Pounds Silk-dressed Flour.
20 Bevilaquah, L., Lyndoch.—Two Hundred Pounds Silk-dressed Flour.
21 Magarey, Messrs., and Co.—One Hundred Pounds Silk-dressed Flour.
22 Colman, William, Strathalbyn.—One Hundred Pounds Silk-dressed Flour.
23 Allen, William, Nuriootpa.—One Hundred Pounds Silk-dressed Flour.

GENERAL MANUFACTURES.

24 Moody, John, Adelaide.—Two Dozen Sauces, for culinary purposes.
25 Lavin, John, Port Adelaide.—Four Tins of Biscuits.
26 Chance, Mrs. L. A., Parkside.—Three Samples of Sauces, Two Dozen Chutnee, Twelve Samples Pickles, and Eighteen Tins Jams.

27 Davis, F. C., Fulham.—Bottled Fruits, Pickles, Sauces.
28 Hardy, Thomas, Bankside.—Raisins and Almonds.
29 Tidmarsh, John, and Co., Adelaide.—Yellow Soap.

MANUFACTURES, MACHINERY, &c.

30 Ramsay, J. G., Mount Barker.—Reaping and Thrashing Machine; Four-horse Triple Plough, Three-horse do.; and Three-horse Swingle-tree for Plough.
31 Mellor, Joseph.—Agricultural Implements, &c.
32 Nitschke, W., Adelaide.—One large Distilling Apparatus; Specimens of Hammer Work.
33 Simpson, A., and Son, Adelaide.—Fire-proof Safes, and Tin Packages for articles requiring to be hermetically sealed.
34 Steiner, H., Adelaide.—Jewellery.
35 Wendt, J. M., Adelaide.—Gold and Silver Ware.

MINERAL PRODUCTS.

36 Proprietors of the Moonta Mines.—Copper Ore.
37 Proprietors of the Wallaroo Mines.—Ores and Photographic Views.
38 Proprietors of the Wallaroo Smelting Works.—Ores, Refined Copper, &c.
39 Belcher, J. M., All Nations Mine, near Kooringa.—Small Specimen Copper Ore.
40 Singleton, F. C., near Mount Barker.—Ore containing Gold, Nickel, Silver, and Iron Pyrites.
41 Talisker Mining Company, near Rapid Bay.—Silver Lead, Ores, &c.
42 Ayers, Hon. H., Burra Burra.—Cabinet Specimens of Copper Ore.

WINES AND SPIRITS, &c.

43 Smith, S., and Son, Yalumba Vineyard.—White and Red Wines.
44 Fisher, Daniel, Roussillon Vineyard.—Brandy, and White and Red Wines.
45 Hunt, F. R., Yantaringa Vineyard.—Red and White Wines.
46 Green, W., Gawler Park Vineyard.—White and Red Wines.
47 Greig, A., Dirleton Vineyard.—Red and White Wines.
48 Randall, D., Glen Para Vineyard.—White and Red Wines.
49 Edmonds, J., Norwood Vineyard.—Red and White Wines.
50 Hardy, T., Bankside Vineyard.—Red and White Wines.
51 Gillard, J., Sylvania Vineyard.—Red Wines.
52 Wilson Brothers, Annandale Vineyard.—Red Wines.
53 Martin, W., Bellevesta Vineyard.—Red Wines.
54 Scott, R. and J., Brookside Vineyard.—Red Wine.
55 Charlesworth, T. W., Evandale Vineyard.—White and Red Wines.
56 Auld, P., Auldana Vineyard.—White Wine.
57 Stead, J., Nelson Grove Vineyard.—Red Wines.
58 Ross, R. D., Highercombe Vineyard.—White and Red Wines.
59 Winckel, F., Buchsfelde Vineyard.—White and Red Wines.
60 Peake, E. J., S.M., Clarendon Vineyard.—Nine Samples Red and White Wines.
61 Randall, William, Randellsen Vineyard.—Red Wines.
62 Reynell, John, Reynell Vineyard.—White and Red Wines.
63 Seppelt, J. E., Seppeltsfield Distillery.—Samples of Liqueurs, Spirits of Wine.
64 Crawford, E. J. F., Hindmarsh Brewery.—Cask of Pale Ale.
65 Bickford, A. M., and Sons.—Stomachic Bitters.

MISCELLANEOUS.

66 Gemschke, J.—Colonial Grown and Cured Tobacco.
67 Kellett, J.—Rough and Polished Specimens of Marble.
68 Holme, C. A.—Model of Fire Escape.
69 Macgeorge, J.—Design for Post-office, Sydney, and Photographic Views.
70 Hall, R.—Six Photographic Views of Adelaide Scenery.
71 General Committee.—Sixteen Photographic Views of Adelaide Streets.
72 General Committee.—Sample of Resin from Grass Tree; Cabinet Specimens of Woods from Northern Territory, Adam Bay; and 17 Specimens of South Australian Woods.
73 General Committee.—Eighty Facsimiles of South Australian Fruits, modelled in Gypsum.
74 General Committee.—Newspapers published in the Colony during week ending 22nd September, 1866.

SUPPLEMENTARY.

75 **Duffield and Co., Gawler Town.**—One Bag, 200 lbs., Silk-dressed Flour.

76 **Wehls, J.,** Mount Gambier.—Six sides of Kip Leather.

77–80 **Wehl, Dr.,** Gambierton.—Sample of Dressed Flax; Bag of Undressed Flax; Sample of Twine; Sample of Cord.

81 **Marsden, J.**—Sample of Undressed Flax.

82 **Mellor, Joseph,** Adelaide.—Patent Mowing Machine, with self-acting side delivery and adjustments.

83–84 **Kelly, P.,** late of Gawler Town, Adelaide.—A Silver Inkstand; a Silver-gilt Crucifix. Made by C. E. Firnhaber.

85 **Murninnie Mining Company,** near Franklin Harbour.—One Ingot of Bismuth; One Ingot, broken to show structure; Specimens of Cupreous Bismuth Ore, from different levels; Specimens of Plumbago, from the deep winze.

86 **Hay, W.,** Gum Creek, near the Burra.—Two specimens of Earthy Cobalt, containing about 72 per cent. of manganese and 8 per cent. of cobalt; One Ingot, containing about 64 per cent. of copper and 28½ per cent. of metallic cobalt, obtained by Thomas and Co.'s patent process for extracting cobalt from its ores.

87 **Callender and Co.,** Melbourne—Auldana Vineyard.—Twelve Bottles of Espanoir, red, 1860; Twelve Bottles of Auldana, white, 1865; Twelve Bottles of Verdeilho, white, 1860; Six Bottles of Hock, white, 1860.

87½ **Hodgkiss, Hon. John,** Port Lincoln.—Specimens of Coal; Specimens of Carbonaceous Limestone.

88 **Callender and Co.,** Melbourne—Rains, Stepney.—Twelve Bottles of Malbec, red, 1861.

89 **Gillard, J.,** Norwood.—Six Bottles of Shiraz, red, 1863.

90 **Nitschke, W.,** Adelaide.—Two Bottles of Spirit, 60° overproof, made by one operation in the Exhibition Building, from distilling apparatus, No. 32.

91–92 **Babbage, B. Herschel,** St. Mary's.—Book of Pen and Ink Sketches, made during an exploration into the N.W. interior of South Australia in 1858, with views near Adelaide and Port Lincoln; Woodcut from drawing of part of Mr. Babbage's calculating machine.

93 **Stutely, J. F.,** Adelaide.—Glass Shade containing the following stuffed birds:—Buggeregar Parakeet, Diamond Bird, Mock Regent Bird, Finch, Blue Wren, Small Red-faced Parakeet.

94 **Wright, Fred.,** Manager of National Bank, Melbourne—Kangaroo Island.—Six Nautilus Shells. The habitat of the Nautilus is the semi-tropical seas of the Fiji, Solomon, and other islands of the Pacific; but they are frequently found cast ashore on Kangaroo Island, being probably brought there by some ocean current.

95 **Hodgkiss, The Hon. John,** Adelaide.—Gold Tokens, coined from Victorian Gold at Adelaide, in 1852, by B. Herschel Babbage, Government Assayer, with machinery contrived by him and made in Adelaide. The gold is reduced by the addition of copper to the mint standard of 22 carats, and the weight of each token is ——. These were the first coins ever struck in Australia, the Adelaide Assay Office having preceded the Sydney Mint.

96 **Hodgkiss, The Hon. John,** near the Coorong.—Mineral Caoutchouc. This is a new product, yielding by analysis made in London —— per cent. of kerosene oil. Whether it is of mineral or vegetable origin is a disputed point. It is found in thin layers on the surface of the ground.

97 **General Committee,** Adelaide.—Two Copies of the *Statistical Register* of South Australia, for 1865.

SECOND SUPPLEMENTARY.

98 **Mellor, Joseph,** Adelaide.—One Load-adjusting Dray; Two Corn Screens, for Grain Sampling; Two Winnowers, for Dressing Grain; One Pair Steam-made Wheels; One Set Zigzag Harrows; One Set Circular Harrows; One Elevator, for Filling Sacks; One Gate; Cast-iron Hinges for Gates; One Revolving Garden Table; One Fire Grate; Six Boot Jacks. Invented and Manufactured by Exhibitor.

99 Proprietors of Wallaroo Smelting Works.—Copper (Coarse and Refined), in Cake, Tile, and Ingot; Raw Sulphur, from Roasting Kilns; Superphosphate of Lime, produced during the operation of Smelting, &c. From Wallaroo, Yorke's Peninsula.

100 Proprietors of Wallaroo Mines.—Copper Ore, viz.—Yellow, Purple, Grey, Red, and Black Ores; Muriate of Copper, &c. From Wallaroo, Yorke's Peninsula.

101 Proprietors of the Moonta Mines.—Copper Ore, viz.—Yellow, Purple, Ruby, and Malleable Ores. Estimated from 30 to 60 per cent. of Pure Copper. From Moonta, Yorke's Peninsula.

102 Ramsay, J. G., Mount Barker.—Reaping and Thrashing Machine, of recent improvements, Shape and Position of Comb, Lightness of Draught and Weight on Horse's Back, Spring and Ratchet on Driving Wheel, Diagonal Studded Concave and Sectional Drum. Invented and Manufactured by Exhibitor.

103 Steiner, H., Adelaide.—Silver Epergne, 6 ozs.; Silver Inkstand, 6 ozs.; Jewel Case, 4 ozs.; Silver Presentation Cup, 6 ozs.; Lady's Companion; Jewel Case, 3 ozs.; Claret Jug, 4 ozs.; Small Inkstand.

QUEENSLAND COURT.

[Queensland Court, West Side of Great Hall, and adjoining the New Caledonia Court.]

Class I.—Mineral Products.

SECTION 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Limes, Cements, Clays, Salt.*

1 Feez, Albrecht, Rockhampton.—Specimen of Auriferous Quartz, M'Donald's Flat, Peak Downs; Specimen of Auriferous Quartz, Spring Creek, Peak Downs. Exhibited on behalf of Mr. N. Reimers.

2 Griffin, T. J., Claremont.—Specimens of Auriferous Quartz, Prince of Wales Reef, Peak Downs; Specimens of Auriferous Quartz, Leichhardt and Christmas Reefs; Specimen of Copper Ore from Peak Downs.

3 Walsh, Wm. Henry, Brisbane.—Sample of Burram River Coal for steaming purposes, said to equal Welsh.

Class II.—Animal Products.

SECTION 4.—*Wool, Hair, Skins, Furs, Silk, Feathers, Horns, Hoofs, Bones, Guano.*

4 St. George, H., Rockhampton.—Specimens of Wool—Cheviot-Merino Rams, seven months old, cross between Cheviot Rams and Merino Ewes.

4a Timbrell, Ann, Princes-st., Petrie-terrace, Brisbane.—Muffs, Hearth Rug, and Skins of Victorian Native Animals.

SECTION 5.—*Meat, Fish, Fowl, whether Salted, Dried, Smoked, or Preserved; Gelatine, Isinglass, Milk, Butter, Cheese.*

5 Davis, M. B., Town Marie, Ipswich.—Navy Beef and Ox Tongues, prepared according to Dr. Morgan's patent process.

SECTION 6.—*Miscellaneous.*

6 Mitchell, Graham, Brisbane.—A Ball, composed of Metallic Substances, found in the Stomach of a Mare; Fistula Tube.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

SECTION 7.—*Cereals, Agricultural and Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

7 Bell, Thomas, Edward-st., Brisbane.—Canister of Snuff. Manufactured by Exhibitor.

8 Booth, E. H., Queen-st., Brisbane.—Sea Island Cotton, of second year's growth from the same plants; Sample of New Orleans Cotton, first year's growth. By Producer.

9 Chubb, C. F., Ipswich.—Cayenne Pepper. Grown and manufactured by Exhibitor.

10 Collison, M., Rockhampton.—Specimen of Cotton.

11 George, J. G., Old Bagoo-road, Brisbane.—Four Samples Cayenne Pepper.

12 Lyons, C. B., Brisbane.—Cotton. Grown by Exhibitor.

13 Michael, Alfred, North Rockhampton.—Maize.

14 Orr, William, Rockhampton.—Specimen of Sea Island Cotton. Produced and manufactured by Exhibitor.

15 Sekl, C. L., and Co., Fairney-lawn, near Ipswich.—Cotton. Grown by Exhibitors.

16 Steel, William, Edward-st., Brisbane.—Cayenne Pepper, manufactured.

17 Temple, David, Rockhampton.—Specimen of Swamp Oak; Specimen of Lemon-tree.

18 Mueller, Dr. Ferdinand, Director of Botanical Gardens, Melbourne.—
Wood of Cardwellia sublimis—Ferdinand Mueller.
Wood of Darlingia spectatissima—Ferdinand Mueller.
Wood of Vitex macrophylla—R. Brown.
Wood of Helicia Scottiana—Ferdinand Mueller.
Wood of Eremophila bignoniflora—Ferdinand Mueller.

19 Thozet, O., Rockhampton.—One Hundred specimens of Wood indigenous to Northern Queensland—collected, arranged, and described by Exhibitor; Five specimens of Fibre; Ten specimens of Bark; Five specimens Gum Resin; Four specimens Gutta-percha; Five specimens Leaves.

20 Towns, R., and Co., Brisbane.—Bale Sea Island Cotton; Upland Cotton, grown at Townsville by Exhibitor.

21 Thozet, A., Rockhampton, Queensland.—Arrowroot; Leaves of Gastrolobium Grandiflorum, for medicinal test; Wood of Eremophila Mitchellii; Wood of Hovea Longipes.

SECTION 9.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

22 Orr, William, Rockhampton.—Specimen of Rosella Jam.

Class IV.—Manufactures and the Useful Arts.

SECTION 11.—*Porcelain and Pottery, Glass, Iron and Hardware, Cutlery, Wickerwork.*

23 Mitchell, Graham, Brisbane.—Horse Shoe, to be used for the Dislocation of the Patella. Exhibited by Inventor.

SECTION 12.—*Leather and its Applications, Bonedust, Animal Charcoal and Oils, Blood, Ammonia, Glue, Fat, Tallow, Stearine, Honey, Wax, Soap, Candles, Varnishes.*

24 Goorly, Christopher, Ipswich.—Gentleman's Hunting Saddle.

25 Mitchell, Graham, Brisbane.—Single Leather Stirrup Leathers. Exhibited by Inventor.

26 Steel, William, Edward-st., Brisbane.—Dugong Oil, manufactured and refined.

SECTION 15.—*Miscellaneous.*

27 David, John, Peak Downs.—Specimens of Mining Tools in Copper.
28 Hume, David, Cooper, Brisbane.—Excursion Keg, indented work on the bilge.
29 Pettigrew, W., Brisbane Saw Mills.—Pick, Miners' Axe, and other Handles; Pine Doors.
30 Temple, David, Rockhampton.—Axe Handles and one Adze Handle, made of Water Gum; Model of a Hen Coop; Model of a Raft for Preserving Life.

Class V.—The Ornamental Arts.

SECTION 18.—*Furniture and Decorations.*

31 Tracey, J., Elizabeth-st., Brisbane.—Venetian Blinds and Shutters.

SECTION 19.—*Printing, Stationery, and Bookbinding.*

32 Belbridge, W. C., Government Printing Office, Brisbane.—Specimens of Printing and Bookbinding.
33 Diggles, Silvester, Kangaroo-point, Brisbane.—Specimens of a Serial Work on the Ornithology of Australia. By Exhibitor.

Class VI.—Machinery.

SECTION 26.—*Miscellaneous.*

34 Temple, David, Rockhampton.—Plan of a Bog Extricator.

WESTERN AUSTRALIAN COURT.

[Western Australian Court, West Side of Great Hall, next to South Australian Court.]

Class I.—Mineral Products.

SECTION 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Limes, Cements, Clays, Salt.*

1 Burgess, Mr. S. E., York—Pipeclay.
2 Central Committee—11 bags Earth for analysis.
3 Do. 1 block Hone Stone.
4 Do. 2 blocks Slate Stone.
5 Do. 1 package Ochres, crude yellow and red.
6 Chester, Mr. George—Specimens of Surface Iron Ore.
7 Coates, Mr. W., Northam-road—Iron Ore from Darling Range.
8 Drummond, Mr. J., Champion Bay—Specimens of Copper Ore.
9 Fortune Mining Company—Block of Yellow Sulphuret of Copper Ore, weight 7 cwt. 3 qrs. 3 lbs., containing 20 per cent. of Copper.
10 Shenton, Mr. A., Perth—Iron Ores from Camden Harbour.
11 Do. Hematite from Roebuck Bay, large vein.
12 Do. Cubical Iron from Nichol Bay.
13 Do. Crystals of Black Oxide of Copper; "Run Lead" in spar, and cubes of Lead in spar, from Wheal Fortune mine.
14 Do. Coal from Irwin River.
15 Do. Mudstone from Shark's Bay.
16 Do. Fibrous Gypsum from Shark's Bay.

17 Shenton, Mr. A., Perth—Jasper and Iron Ore from 150 miles E. of York.
18 Do. Specimens of Rocks from Camden Harbour.
19 Shenton, Mr. George, Perth—Five specimens of Copper Ore from his mines, the Gwalla Gwalla, Yanganooka, and Irwin River.
20 Turner, Mr. James, Perth.—7 Geological Specimens from Nichol Bay.
21 Do. 8 Geological Specimens from eastward of York.
22 Do. 1 do. Champion Bay.
23 Do. 2 do. Legrange Bay.
24 Do. 2 do. (Pipeclay), Roebuck Bay.
25 Do. 7 Pebbles found in bed of stream at Nichol Bay.
26 Do. 3 Sea Specimens from reef at Nichol Bay.
26*a* Walcott, Mr. Pemb., Warren River, W.A.—Peat, Chalk, Bitumen, Inflammable Mineral, Black Sand, Amber, and other Mineral Substances.

Class II.—Animal Products.

SECTION 4.—*Wool, Hair, Skins, Furs, Silk, Feathers, Horns, Hoofs, Bones, Guano.*

27 Mews, Mrs., Perth—Silk, box of Cocoons, and small quantity wound off.
28 Sholl, Mr. H., Perth—Silk, and small quantity wound off.
29 Shenton, Mr. A., Perth—Amber, plentiful on south coast.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

SECTION 7.—*Cereals, Agricultural and Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

30 Armstrong, Mr. F. F., Perth—6 specimens of the Mountain or Lace Moss.
31 Barker and Gull, Messrs., Guildford—Log Sandalwood *(Santalum persicarium)*, partly polished.
32 Do. Log Raspberryjam Wood *(Acacia)*.
33 Brockman, Mr. W. L., Swan River—Linseed grown on alluvial soil.
34 Carr, J. G. C., Perth—Gums, various, viz.:—1. Wattle. 2. Manna. 3. Red. 4. Red Gum dried from liquid. 5. Liquid Red.
35 Carter, Messrs. T. and H., Perth—1 bushel Wheat, 65½ lbs.
36 Do. Sample of Gum *(Xanthorrhœa)*, commonly called Blackboy.
37 Central Committee, Perth—A Pile from the Perth Causeway Bridge over the River Swan. It was driven in the year 1840, and taken up in 1865, having been 25 years in use subject to the usual influences of wet and dry, and between wind and water. It is polished on one side to show the small effect produced by 25 years' wear and tear.
38 Do. Small specimen Sandalwood *(Santalum latifolium)*.
39 Do. Frame of above, to show grain *(scented)*.
40 Do. Raspberryjam Wood *(Acacia sps.)*.
41 Do. do. from Champion Bay.
42 Do. Specimen of Mottled Wood, 3 feet long, 2 feet 3 inches wide, suitable for furniture; can be had of any ordinary length.
43 Do. A specimen of Tuart Wood *(Eucalyptus gomphocephala)* from the south, near the Capel River. The log from which this was cut was 30 feet long, and 2 feet 5 inches square at the top end, the butt being 3 feet 5 inches on one side and 3 feet on the other. A large quantity of this timber has been exported; it is suitable

for shipbuilding and long, heavy framing, being very durable, dense, and strong.

44 Central Committee, Perth—1 flitch of Tuart.
45 Do. Section of Tuart, 2 feet 6 inches long by 2 feet 2 inches.
46 Do. do. Showing the feather, equal satinwood.
47 Do. Specimen of Casuarina *(Sheaoak)*.
48 Do. do. Gunstock.
49 Do. do. Rulers to show the grain.
50 Do. do. Small piece polished.
51 Do. do. Specimens to show the grain.
52 Do. do. Frame to show the grain.
53 Do. Banksia, sp., specimen half log
54 Do. Banksia, Frame to show the grain.
55 Do. do. Rulers to show the grain.
56 Do. (Melaleuca) Teatree Bark, lowland.
57 Do. do. highland.
58 Do. Roofing Sheet do. do.
59 Do. Roofing Sheet, Teatree Bark, 15 years in use.
60 Do. Fibre, Zamia top, for tying bundles.
61 Do. Pith Rush for Candles.
62 Do. Square Reed.
63 Do. Fibre, Native Hemp, or flax (blue).
64 Do. Fibre, Tough Bark.
65 Do. Small Flag Rush.
66 Do. Native Yam Root, with stem or flower.
67 Do. Eucalypti, Mahogany, seed and leaves.
68 Do. do. Bark.
69 Do. Red Gum, bark and seed vessels.
70 Do. Hakea or Tanning Bark for nets.
71 Do. Nuytsia Gum.
72 Do. Prickly Scrub Bark.
73 Do. 2 pieces of upland Teatree.
74 Do. 2 pieces Lowland or Swamp Teatree.
75 Do. do. Mountain Casuarina.
76 Do. Palm or Zamia Wool, for packing or bedding, &c.
77 Do. Specimens of Excrescences; these grow round the trunk of a tree, and are of very considerable extent; sometimes on a tree of 18 in. diameter the excrescence will be as much as 12 feet.
78 Clifton, W. P., Perth—200 lbs. Wheat from Preston River, Australind, 20 bushels per acre.
79 Logue, Mr. Joseph, Upper Swan—Flax grown on alluvial soil.
80 Meares, Mr. R. G., York—Log Sandalwood (Santalum).
81 Do. Log Raspberryjam Wood (Acacia).
82 Mason, Mr. B., Perth—Telegraph Posts of Mahogany, or Jarrah (Eucalyptus marginata).
83 Do. Railway Sleepers of Mahogany.
84 Do. Bundle Laths of Mahogany.
85 Do. do. Trenails of Mahogany.
86 Do. do. Palings of Mahogany.
87 Do. Split Posts of Mahogany.
88 Do. Bundle Split Shingles of Mahogany.
89 Do. Flitches or Planks of Mahogany.
90 Do. Boards Polished of Mahogany.
91 Do. Ship's Knee of Mahogany.
92 Do. Logs Sandalwood (Santalum persicarium), with bark on.
93 Do. Sandalwood, French polished.
94 Do. Case of Leaves and Seeds of Jarrah.
95 Pries, Mr. R. F., Busselton—Gum from Xanthorrhœa, or Blackboy.
96 Do. Samples of various Gums.
97 Ranford, Mr. B. B., Perth—Tanning Bark, Black Wattle; Tanning Bark, Manna Wattle; Tanning Bark, Raspberryjam Bark; Tanning Bark, Champion Bay.
98 Do. Sample of ground Bark.

99 Saw, Mr. Henry, Perth—Polished Mahogany Slab, 8 feet long, 2 feet 9 inches wide, 1½ inches thick.
100 Do. Polished Mahogany Board, 6 feet long, 8 inches wide, 1½ inches thick.
101 Do. 2 Mahogany Boards, in the rough, 3 feet long, 8 inches wide, 1½ inches thick.
102 Shenton, Mr. A., Perth—Gums, Hakea species, found plentifully after autumn rains.
103 Do. Sample of Gum of Nuytsia Floribunda.
104 Smith, Mr. Richard, Perth—Talavera Wheat, 1 bushel from alluvial soil, Swan River, 1865.
105 Do. Poland Oats, 1 bushel, weight 42 lbs.
106 Stirling, Mr. Edmund, Perth—Specimens of Xanthorrhœa, or Blackboy. This plant grows from 5 to 10 feet high, and in some localities from 12 to 16 feet. It is sent for comparison with the Grasstree of Victoria, which produces Shellac, Sugar, &c.
107 Do. Variety of Grasstree called the "King Blackboy," sent for experiment whether the outer coating of the trunk be applicable to paper-making, and whether the substance in the trunk be applicable to rope-making.
108 Turner, Mr. J., Perth—Pods of a Tree that grows at Roebuck Bay.
109 Do. Gum from a Tree that grows at Roebuck Bay.
110 Do. Pods of a Plant (from De Grey River), which is eaten by the natives.
111 Do. Piece of Wood of a small Tree that grows near coast at Nichol Bay.
112 Do. Piece of inland Coral Moss from York.
113 Waldeck, Mr. F., Greenough—Sea Island Cotton, Champion Bay.
114 York District Committee—15 Felloes of York Gum (Eucalyptus loxophleba).
115 Do. 2 Naves of the York Gum.
116 Do. 100 feet of Morrel Wood (Eucalyptus macrocarpa).
117 Do. 30 Spokes Morrel Wood.
118 Summers, Mr. John, Perth—Tuart, or Eucalyptus gomphocephala.
120 Saw, Mr. Henry, Perth—Pair Carriage Naves, prepared.

SECTION 8.—*Flour and Meal, of every Variety and in every Form; Malt, Starch, Gluten, Sago, Tapioca, Arrowroot, Sugar, Confectionery.*

121 Carter, T. and H., Fremantle—1 bag of wire-dressed Flour.

SECTION 9.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs, Fruits, dried or preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

122 Clifton, W. P., Australind—6 bottles Verdeilho, 1857.
123 Do. do. do. 1859.
124 Ferguson, Mr. C., Swan—One box Raisins.
125 Hardey, Mr. Joseph, Peninsula—Wine, several vintages.
126 Do. Dried Fruits, &c.
127 Jecks, Mr. T., Guildford—Olive Oil.
128 Waylen, Dr., Guildford—Wine of various vintages.
129 Saw, Mr. Henry, Perth—2 dozen Pale India Ale, brewed from pure malt and hops only, the malt made in Western Australia from barley grown there.

Class IV.—Manufactures and the Useful Arts.

SECTION 11.—*Porcelain and Pottery, Glass, Iron and Hardware, Cutlery, Wickerwork.*

130 Turner, Mr. James, Perth—Model of a crosscut saw for cutting down trees close to the ground. Invented by J. W. Turner, Perth.

SECTION 12.—*Leather and its Applications, Bonedust, Animal Charcoal and Oils, Blood, Ammonia, Glue, Fat, Tallow, Stearine, Honey, Wax, Soap, Candles, Varnishes.*

131 Glaskin, Mr. F., Perth—1 box Soap.

132 Ranford, Mr. B. B., Perth—Leather tanned and dressed—6 sides waxed Kip, 4 sides black grain do., 1 skin black grain Calf, 6 do. waxed Calf, 2 sides Sole Leather, 1 dozen waxed Kangaroo Skins, 1 dozen black grain do.

133 Ranford, Mr. B. B., Perth—2 sides black Harness, 1 Stirrup Butt, 1 Bridle Butt, 1 Skirt Side, 1 dozen waxed Wallaby Skins, 1 dozen Bazil, 2 Kangaroo Skins (white), 1 dozen large tanned Kangaroo Skins, 1 dozen small do.

SECTION 14.—*Articles of Clothing; Lace, Embroidery, Specimens of Native Workmanship.*

134 Central Committee—Native Weapons, Ornaments, &c.

135 Shenton, Mr. A., Perth—Native Ornaments, man's Belt and Pearl Shell, woman's Necklace and Bracelet, both from Roebuck Bay.

136 Turner, Mr. James, Perth—A piece of Net, made by the natives of De Grey River; also String, made by same; some of the grass they make the String from, some prepared, other as gathered.

137 Do. A piece of native Stick, or "Wanner," of the De Grey natives.

Class V.—The Ornamental Arts.

SECTION 16.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Engravings, Carvings.*

138 Dean, Mr. E. C., Convict Works Department, Fremantle—8 specimens of Drawing, Lithography, Characteristic Writing, Hill Shading, &c., framed and glazed.

139 Do. Specimens of Characteristic Writing (executed with one of Gillott's lady's pens), framed in mahogany.

140 Do. Specimen of Plan Drawing, mahogany frame.

141 Do. Specimen of Lithography, Writing, and Etching, banksia frame.

142 Do. Specimen of Etching, showing the different characteristics used in plan drawing, sheoak frame.

143 Do. Specimen showing mode of drawing and shading coast work, wando frame.

144 Do. Specimen of Hill Shading, brush work, peartree frame.

145 Manning, C. A., Fremantle—System for a complete Decimal Currency, illustrated, &c., in five tables, colonial-wood frames.

146 Powis, Mr. C., Perth—Statue of the Saviour, made of plaster-of-Paris (solid), intended to be viewed at an elevation of 20 feet; 7 feet 3 inches high, without the pedestal. Made by a working man, without model or copy. For sale.

147 Central Committee, Perth—Photographic Views, &c.

148 Do. Plan of Mineral Districts, drawn by Mr. E. C. Dean.

149 Stirling, Mr. E., Perth—Specimen of Sandalwood, Engraving Blocks, &c.

150 Central Committee, Perth—A model Whaleboat.

151 Do. A model Surfboat.

152 Do. A Conical Buoy.

153 Do. A Cask Buoy.

154 Do. A Nun Buoy.

SECTION 18.—*Furniture and Decorations.*

155 Bostock, Rev. G. J., Fremantle—Sandalwood Dagger and Chain, 14½ inches, cut from a solid piece 12½ inches long, the chain possessing the movements of a curb.

156 Central Committee, Perth—An Inlaid Ttable, containing specimens of tuart, jam, sheaoak, banksia, peartree, sandalwood, cypress, satin-wood, wando, tuartroot, peppermint, in addition to mahogany.

157-67 Do. Specimens of various woods.

168 Do. Every Man's own Letter Clip, wire spring, new design, on banksia stand.

169 Do. Every Man's own Letter Clip, steel loop, new design, on sandal-wood stand, with mahogany moulding.

170 Do. Sandalwood Vase, on mahogany stand.

171 **King, Mr. Charles, Perth—Picture-frame of sandalwood and raspberryjam-wood, containing three polished panels of Swan River mahogany.**
172 **Saw, Mr. Henry, Perth—Set of four polished mahogany Table Legs.**

SECTION 20.—*Architectural and Engineering Models and Drawings, Maps, Charts, Plans, and Sections.*

173 **Dean, Mr. E. C., Fremantle—Specimen of Architectural Drawing.**
174 Do. Specimen of Architectural Drawing, tuart frame.

SECTION 21.—*Miscellaneous.*

175-84 Armstrong, Mr. F. F., Perth—Natural History Specimens.
185 Bostock, Rev. G. J., Fremantle—Small Birds, shot near Fremantle.
186 Do. Case of White Egrets and Black-winged Stilt (female), shot near Fremantle, on mahogany stand; 2 specimens of York Devil (*Molock horridus*).
187 Do. Case containing Owl, with Native Squirrel and Night-jar, on mottled sandalwood stand.
188 Do. Case (mahogany) of Specimens of *Coleoptera* (Beetles), from Esperance Bay and eastward; collected by Dempster and Co. from Champion Bay, by W. Phelps, Esq., from Nichol Bay and Fremantle.
189 Do. Case of Beetles, found in ants' nests in and round Fremantle.
190 Shenton, Mr. A., Perth—Conchology—953 Specimens of Shells, including about 740 distinct varieties.
191 Do. Cœlenterata and Protozoa—Corals and Sponges, &c.—about 100 specimens from all parts of the coast.

ADDENDA.

192 **Dean, E. C., Fremantle—Copied Map of the Mining Districts of Western Australia.**
193 Central Committee, Perth—Bitumen Specimens from Mount Stirling.
194 Do. Bitumen Specimens from Nichol Bay.
195 Do. Prepared Extract from Herbs, producing a beverage like Raspberry Vinegar.
196 **Muir, A., Albany—One Bushel Wheat.**

[N.B.—Applications for information respecting, or for the purchase of, exhibits to be made to E. G. Atkinson, Esq., Secretary to the Commissioners for Western Australia.]

NEW ZEALAND COURT.

[New Zealand Court, West Side, next to the South End of the Great Hall.]

Class I.—Mineral Products.

SECTION 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Limes, Cements, Clays, Salt.*

1 **Ancell, Wm.C., Waikowaiti, Otago.**—Specimens of Alum.
2 **Baker, J. H., Invercargill.**—Samples of Sands, Platinum, Stones, &c.
3 **Barnhill, Thomas, Castle Rock Station.**—Specimens of Fossil Shells, &c., from Castle Rock.
4 **Committee of Nelson.—Magnetic Iron Sand from Wangapika.**
5 **Dalglish, J., Invercargill.**—Sample of Gold, from Paki Goldfield.
6 **Evans, J. L., New Zealand, Mere.—A magnificent Specimen of Nephrite,** fifteen inches in length, property of Captain Francis Cadel, in the collection of the Mining Department.
7 **Irwin, F. W., M.D., Nelson.**—Lead Ore from Wangapika.

8 Kelly, Thomas.—1 Box Titaniferous Iron Ore, Block of Trachyte Rock from the Moturoa Sugar Loaves, Block of Taranakite, Block of Prevailing Rock of District, Cubic Foot of Subsoil, Cubic Foot of Surface Soil.
9 Kelly, Thomas, New Plymouth.—Two Boxes of Clays, one Box of Bricks.
10 Nelson Coal Mines, Grey River, New Zealand.—Samples of Coal.
11 Reienker, B. H., Mount Beaumont Station.—Sample of Coal, from Mt. Beaumont.
12 Webb, J.—Collection of Coals and Minerals.
13 West Wanganui Coal Company.—Samples of Coal from Wanganui.
14 Weisenhaven, C.—Specimen of Plumbago.
15 ——, Wangapika.—Magnetic Iron Sand.
16 ——.—Pillar of Coal, showing the thickness of the seam, from the River Buller, Nelson.

Section 2.—*Chemical and Metallurgical Products and Processes.*

17 Alpha Petroleum Company.—Specimens of Crude Petroleum.

Section 3.—*Miscellaneous.*

18 Meyer, C., Invercargill District.—Samples of Draining Tiles, Bricks, and Clay.

Class II.—Animal Products.

Section 4.—*Wool, Hair, Skins, Furs, Silk, Feathers, Horns, Hoofs, Bones, Guano.*

19 Conner, F., Waian District—Leicester Wool.
20 Gappar, Miss.—Specimen of Silk, the Produce of 108 Worms, fed on Black Mulberry.
21 Gee, Benjamin.—Various Samples of Wool.
22 Hamilton, R., Oteramika, Morton Maine.—Fleeces and Samples of Leicester and Lincoln Wool.
23 Hodgkinson, Dr. G., Riverton District, Mount Fairfax.—Fleeces and Samples of Leicester and Lincoln Wool.
24 Honeyfield, H.—Sample of Improved Southdown Wool.
25 Stewart and Brown, Blackmount Station.—Sample of Merino Wool.

Section 5.—*Meat, Fish, Fowl, whether Salted, Dried, Smoked, or Preserved; Gelatine, Isinglass, Milk, Butter, Cheese.*

26 Batey, J., Nelson.—Cheese.
27 Tatton, J. W., Nelson.—Chromes. Prepared by Exhibitor.
28 Yems, Mrs., and Gledhill, Miss.—One Case of Silk.

Section 6.—*Miscellaneous.*

29 Monroe, D.—Male and Female Huia.
30 Poynter, John.—Pair Pakapos.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

Section 7.—*Cereals, Agricultural and Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

31 Armstrong, H., New River District.—Samples of Wheat, Italian Rye Grass Seed.
32 Biggs, F., Christchurch, Canterbury.—New Zealand Flax. Dressed by a new process.
33 Biggs and Sellars.—Samples of New Zealand Flax.
34 Boyd, Mr.—Sample Oats.
35 Gee, Benjamin.—Various Samples of Kauri Gum, Colours, and Chromate of Iron.

36 Grant and Reid, Riverton District.—Sample of Barley, sample of Wheat, sample of Oats.
37 Hamilton, R., Oteramika, Morton Maine.—Sample of Barley, sample of Oats, sample of Perennial Grass Seed, sample of Turnip Seed, sample of Wheat, Red Derwent Potatoes, White Early American Potatoes.
38 Hamilton, R., Oteramika, Southland.—Red Derwent Potatoes, White Early American Potatoes.
39 Hay Brothers, Invercargill.—Sample of Wheat, sample of Oats.
40 Hodgkinson, S., Riverton District, Mount Fairfax.—Sample of Barley, sample of Oats, sample of Rye.
41 Hamilton, R.—Two Samples Potatoes.
42 Harley and Sons, Raglan Brewery, Nelson.—Sample of Hops and Malt. Grown by Exhibitors.
43 Hooper, Dodson and Aitken, Nelson.—Sample of Hops. Grown by Exhibitors.
44 Kelly, Thomas.—Half-section of the Trunk of a Red Pine Tree, or Rimu; one cubic foot Red Pine Timber; one cubic foot of Puriri; nine specimens of Native Woods in the form of Books, containing Leaves and Bark, viz.:—Puriri or Iron Wood, Rimu or Red Pine, Rata, Pukateo, Tawa, Towai, Red Kohekohe Hinau, and Honeysuckle; four young Plants New Zealand Flax, Paper-making Materials, Towai Bark, and Hinau Bark.
45 Kelly, Thomas, Taranaki.—Tobacco grown and prepared by Maories.
46 Morton, J., Wallacetown.—Sample of Wheat, sample of Perennial Grass Seed.
47 Nattrass, Luke.—Three Samples Bark of Lime Tree.
48 Parker, Robert C., Dunedin.—New Zealand Flax Fibre. Manufactured by Exhibitor.
49 Smith, Alexander.—Sample Ryegrass Seed.
50 Scully and Dersham, Riverton District.—Samples of Barley and Malt.
51 Smith, John, Invercargill.—Samples of Zealand Woods, White Pine, Red Pine, Black Pine, Totara, Manuka, Goa.
52 Stewart, S., Waikivi District.—Sample of Barley.
53 Sutton Bros., Waianiwa.—Sample of Field Peas.
54 Wood, W. A., Otago.—Specimens of Impressions of New Zealand Ferns.

SECTION 8.—*Flour and Meal, of every Variety and in every Form; Malt, Starch, Gluten, Sago, Tapioca, Arrowroot, Sugar, Confectionery.*

55 Grant and Reid, Riverton District.—Samples of Flour and Oatmeal.
56 Hay Bros., Invercargill.—Samples of Flour and Oatmeal.
57 Hooper, Dodson and Aitken, Nelson.—Sample of Malt. Manufactured by Exhibitors.
58 Junor, W. H. B.—Sample Flour.
59 Scully and Dersham, Riverton District.—Samples of Malt and Barley.

SECTION 9.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

60 Harley and Sons, Raglan Brewery, Nelson.—One Hogshead Ale.
61 Hooper, Dodson and Aitken, Nelson.—1 hhd. Ale from Malt made and Hops grown by the Exhibitors; Bottled Ale and Porter, also made by Exhibitors from colonial malt and hops.
62 Joel, W. A., Dunedin.—1 hhd. Ale. Brewed by Exhibitor.
63 Marshall and Copeland, Dunedin, *N.Z.*—Ale and Porter, in hogsheads.
64 Martin, T., Warmea-road.—Bottled Cider.
65 Moore and Co., Canterbury.—1 hhd. Ale. Brewed by Exhibitors.
66 Whiston, —, Auckland.—Bottled Ale and Porter.

SECTION 10.—*Miscellaneous.*

67 Baxter, J. R.—Collection of Walking Sticks, indigenous, and mounted by Exhibitor.
68 Stewart Mr.—Four Frames of Ferns.

Class IV.—Manufactures and the Useful Arts.

SECTION 11.—*Porcelain and Pottery, Glass, Iron and Hardware, Cutlery, Wickerwork.*

69 Jeffries, J. S., Dunedin.—Angle Iron Fencing.
70 Lambert, Mr., Dunedin.—Galvanised Iron Rope and Wire.

SECTION 12.—*Leather and its Applications, Bonedust, Animal Charcoal and Oils, Blood, Ammonia, Glue, Fat, Tallow, Stearine, Honey, Wax, Soap, Candles, Varnishes.*

71 Beissel, G., Dunedin.—Glue.

SECTION 13.—*Fabrics in Silk, Wool, Cotton, Hair, Flax, Hemp, Thread, Straw—Spun, Woven, Felted, or Laid—Plain or Mixed.*

72 Barlow, Mr., Nelson—Three Maori Kits, made from New Zealand Flax.
72a Brotherton, Jane.—Ornamental Bag, made of dyed flax.
73 Gibbs and Dennie.—Sample of Cloth.
73a Scott, John, Invercargill.—Prepared Flax, Twines, &c.

SECTION 15.—*Miscellaneous.*

74 Elliott, C.—Section of Cook's Strait Submarine Telegraph Cable.
75 Gee, Benjamin.—Section of Atlantic Cable.
76 Stewart and Frazer.—Specimens of Cooperage.

SECTION 16.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Engravings, Carvings.*

77 Fletcher, A.—Eight Frames of Photographs, comprising Views of Public Buildings and Wharves of Nelson, New Zealand.
78 Godfrey, Lewis J., Dunedin, N.Z.—Carved Clock Bracket; Carved Clock Stand in Stone; Carved Crab and Shells, in Huon Pine; a Pigeon.
79 Gully, P., Nelson.—Two Water-colour Drawings—"The Southern Alps in Calm" and "The Dividing Range in Storm."
80 Harris, E.—Oil Painting, representing a Scene in the Province of Taranaki.
81 Hoby, G.—Case of Maori Portraits.
82 Nairn, F., Nelson.—Water-colour Drawings.
83 Provincial Government of Nelson.—Three Water-colour Drawings of West Coast of Province of Nelson.

SECTION 18.—*Furniture and Decorations.*

84 Taylor, H.—Lady's Work Table; Specimens of Native Woods.

SECTION 19.—*Printing, Stationery, and Bookbinding.*

85 Elliott, C.—New Zealand Stud Book.
86 Stevens and Bartholomew.—New Zealand Directory.
87 Wilson, W. C.—Statistics of New Zealand, and Observations on the Aboriginals of that Colony.

Class V.—The Ornamental Arts.

SECTION 20.—*Architectural and Engineering Models and Drawings, Maps, Charts, Plans, and Sections.*

88 Baker, J. H., Invercargill.—Topographical Map of Southland. Engraved Map of Southland Hundred.
89 Elliott, C.—A Map of the Province of Nelson and Marlborough.
90 Kelly, Thomas.—One case Local Scenery.
91 Thomas, T., Harbour Master, Bluff.—Model of Semaphore; Model of Yacht

NEW CALEDONIA COURT.

[New Caledonia Court, North End of West Side of Great Hall.]

Class I.—Mineral Products.

SECTION 1.—*Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Limes, Cements, Clays, Salt.*

1 Department of Public Works.—Hydraulic Lime; Limestone; Building Stones (cut and polished); Bricks; Tubular Bricks; Clays.
2 Gardier, Mr., Government Engineer.—Copper Ores, Chromite of Iron, Iron Ores.

Class II.—Animal Products.

SECTION 4.—*Wool, Hair, Skins, Furs, Silk, Feathers, Horns, Hoofs, Bones, Guano.*

3 Colonial Secretary's Department, Noumea.—Head Dress and Mask made of Feathers.
3a Hong Lim (Chinese), Noumea.—Kinds of Tripang, or Bèche de Mer.
4 Marian Brothers, Noumea.—Tortoiseshells.
5 Rev. Fathers Maristes, Noumea.—Samples of Wool.

SECTION 5.—*Meat, Fish, Fowl, whether Salted, Dried, Smoked, or Preserved; Gelatine, Isinglass, Milk, Butter, Cheese.*

6 Gerbes, Mr., Noumea.—Tit Fish, Black Fish, Red Fish, Large White Fish, Small White Fish.

Class III.—Agricultural, Horticultural, and Indigenous Vegetable Products.

SECTION 7.—*Cereals, Agricultural and Garden Seeds, Pulse, Food for Cattle, Tea, Coffee, Cocoa, Tobacco, Spices, Ginger, Hops, Herbs and Aromatic Plants, Timber, Bark, Resins, Gums, Fibres, Dyes, Flax, Hemp, Cotton, India-rubber, Gutta-percha, Materials adapted for Paper-making.*

7 Bavay, Mr., Chemist, Imperial Navy, Noumea.—Samples of Melted Resin, of Kaori (Dammara Moorii), Resini of Gardinia, Gum of Amomum Seylonicum, Seeds from the Acacia Farnesiana, Bark of Morinda Tinctoria, Samples of Resini, Varieti, Resin (raw) of Kaori (Dammara Moorii), samples of Andropogon Schoenanthus, Roots of Morinda, Samples of Amomum Seylanicum.
8 Bertheau, Mr., Noumea.—Sample of Cotton.
9 Boutan, Mr., Director of the Government Model Farm of Yahoue.—Sample of Maize; Samples of Peas, French Beans; sample of Sweet Potatoes,

sample of Arachides, samples of St. Leu and Ceylon Coffee, Seeds of Castor Oil Plant, Acacia Wood, Lamanou Wood, Manioc.

10 Caillard, Dr., Assistant Surgeon Imperial Navy, Noumea.—Sample of Cotton.

11 Convicts' Establishment, Nou Island.—Samples of Cotton, Maize, French Beans, Manufactured Tobacco and Snuff.

12 Dubois, Dr., Imperial Navy, Lifou, Loyalty Island.—Stems and Fibres of the Epiat Plant.

13 Fullet, Mr., Nakety.—Rice, with Stems; samples of Coringuy Rice, samples of Mangalore Rice.

14 Hoff and Marie, Messrs., Naku Takoin.—Stems and Leaves of Ignili (Desmodium), samples of Native Tobacco, Maize, Potatoes; Maize, with their stems; Sugar Canes (5 varieties).

15 Joubert, Mr., Noumea.—Samples of Cotton; samples of Cotton, with Seeds; Sandal Wood (Santalum Austro Caledonium); Samples of Sugar.

16 Joubert, Mr., Noumea.—Samples of Wild Ginger (Amomum Zinziber), Niaiouli (Melalurea Viridifolia), Iron Wood (Casuarina Equiretifolia), Acacia (R. Granularis), Acacia (a Spirorbis), Mab (M. Elliptica), Rhizophora Mangli, Rhizophora Sikemgula, Alcurites, Triloba, Senecarpus Atra, Alemina.

16a Jame Song (Chinese).—Sweet Potatoes and Maize.

17 Local Museum, Lifou.—Sample of Cotton.

17a Montenu, Mr., Tamoa River, Port St. Vincent.—Green Peas.

18 Nau Brothers, Kanala.—Samples of Georgian Cotton; samples of Rice (raw state).

19 Orabona, Dr., Imperial Navy, Noumea.—Samples of Vanilla.

20 Pancher, Mr., Government Botanist, Noumea.—Samples of D. Aculiata, Dried Manioc, Lifou Tea (Limonia Minuta), Roots of Andropogon Schœanthus, Agave Fœtida, Bark of Cordia Sebestiana, Cices Arietinum, Holcus Sorghum, Eupatorium Ayapana.

21 Pion and Alboret, Kanala.—Samples of various qualities of Rice, Peas, and French Beans.

22 Rev. Fathers Maristes, Noumea.—Samples of Cotton, White Algerian Wheat, samples of Coffee, Ricinus Communis, Leaves of the Pandonus Odoratissimus; Stem of Paritium Paoni, and Fibres thereof; Stem of Broussonetia Papyrifera, Stem of Pipturus, sample of Pachyrhizus Tuetilis, Batutus Macrochiza, Manioc, sample of Diorcorea, Alata, samples of Amleota, Batutus Edulis; sample of Vegetable Silk, extracted from the Asclipsias Curassavica.

23 Souchard, Mr., Raita.—Seeds of Arachia Hypogen; Green Peas and French Beans.

24 Vieillard, Dr., Imperial Navy, Noumea.—Bark of Pipturus Nivens, Resin of Gardenia, Gum from the Eutassa Cookii, Resin of Kaori (Dammara Moorii), Bark from the Laurinea, Fibres of the Cordea Sebestiana, Resin of Gardenia (melted), sample of Timber for Building Purposes (Spermolgris).

SECTION 8.—*Flour and Meal, of every Variety and in every Form; Malt, Starch, Gluten, Sago, Tapioca, Arrowroot, Sugar, Confectionery.*

25 Pancher, Mr., Government Botanist, Noumea.—Sample of Gluten, from the Manioc.

26 Portait, Lieut., Imperial Marines Infantry, Noumea.—Samples of Rasped Manioc.

27 Vieillard, Dr., Imperial Navy, Noumea.—Sample of Gluten from the Pix (Tacca Pinnatifida).

SECTION 9.—*Wines, Perry, Cider, Ale, Porter, Spirits, Liqueurs; Fruits, Dried or Preserved; Pickles, Sauces, Vinegar, Pyroligneous Acid, Potash, Soda, Essential and Prepared Oils and their Cakes, Perfumery, Models of Fruits and Vegetables.*

28 Bavay, Mr., Chemist, Imperial Navy, Noumea.—Oil of Alcurites Triloba, Oil of Ricinus Communis, Essential Oil of Kaori, Alcoholic Extract of Morinda Tinctoria, Essential Oil of Santalum Austro Caledonium, Melalenca Viridifolia.

29 Boutan, Mr. A., Director of Government Model Farm, Yahoué.—Samples of Bancoul Nutts (Alcurites Triloba).

30 Gerben, Mr., Noumea.—Samples of Cacholot Oil, and of Andropogon Schœnanthus.

31 Joubert, Mr., Noumea.—Sample of Rum, and of Dried Mushrooms (Peziza Auricula Judas).

32 Pancher, Mr., Government Botanist, Noumea.—Oil of Alcurites Triloba.

Class IV.—Manufactures and the Useful Arts.

SECTION 11.—*Porcelain and Pottery, Glass, Iron and Hardware, Cutlery, Wickerwork.*

33 Colonial Secretary's Department, Noumea.—Native Pottery.

SECTION 13.—*Fabrics in Silks, Wool, Cotton, Hair, Flax, Hemp, Thread, Straw—Spun, Woven, Felted, or Laid—Plain or Mixed.*

34 Gerben, Mr., Noumea.—Rope made of Fibres from the Palm-tree.

35 Hoff and Marie, Nakutakoin.—Native Fabric made of the Bark of the Ficus Prolina.

36 Joubert, Mr., Noumea.—String made of Fur of Pyn Fox.

SECTION 14.—*Articles of Clothing; Lace, Embroidery, Specimens of Native Workmanship.*

37 Colonial Secretary's Department, Noumea.—Samples of Native Workmanship and Articles of Clothing; Aborigines' Ornaments and Arms.

38 Vieillard, Dr., Imperial Navy, Noumea.—Native Woman's Dress, made from Fibres of Cordia.

SECTION 15.—*Miscellaneous.*

39 Hoff and Marie, Nakutakoin.—Walking-sticks and Whip-handles, made of Salsepareille Wood (Smilan Orbiculata).

Class V.—The Ornamental Arts.

SECTION 16.—*Sculpture, Paintings, Casts, Photographs, Lithographs, Models, Engravings, Carvings.*

40 De Greslan and Candelot, Noumea.—Photographic Views of New Caledonia; Photographic Views and Statistics.

SECTION 19.—*Printing, Stationery, and Bookbinding.*

41 Pelletier, Mr., Printer, Noumea.—Statistics of New Caledonia.

Class VI.—Machinery.

SECTION 24.—*Agricultural and Horticultural Machines and Implements.*

42 Boutan, A., Director of the Government Model Farm of Yahoué—Agricultural Machines and Implements.

FINE ARTS GALLERY.

SOUTH WING.

No. 1 COMPARTMENT.

Maps of Tasmania, exhibited by the Surveyor-General..

1 Showing the Municipalities in 1866.
2 Showing the Alienated Lands of the Colony in 1866.
3 Showing the Electoral Districts in 1866.
4 Showing the Internal Communication.
5 Map of the Town of Launceston in 1866.
6 Map of the County of Somerset.
7 Plan of the South-western Approaches to the Port of Hobart Town, drawn by J. E. Calder.
8 Map of the County of Wellington.
9 Map of the Western Portion of the County of Dorset.
10 Map of Hobart Town, illustrated by Frank Dunnett.
11 Maps of the County of Devon ; Portfolio of County Maps.

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12 Progress Map of the Geological Survey of Victoria—Survey Department.
13 Map of Victoria, geologically coloured—Survey Department.
14 Maps of Geological Survey—Survey Department.

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15 SELWYN, A. R. C.—Specimens of Victorian Rocks—Geological Survey Department.

No. 2 COMPARTMENT.

Photographs, &c.

16 PALMER, WILLIAM, *Swanston-st.*—Specimens of Electrotyping.
17 SEVERN, H. A., *Union Bank of Australia.*—Specimen of Anastatic Printing.
18 COMMISSIONERS OF INTERCOLONIAL EXHIBITION.—Photographs of Grapes. By Nettleton.

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19 ST. JOHN, T. A., *Melbourne.*—Case of Stuffed Birds.

No. 3 COMPARTMENT.

Art Donations.

20 BOARD OF EDUCATION.—Original Drawings, Books of Engravings, and Casts. The gift of the Government of His Majesty the King of Italy to the Public Schools of Victoria.

Ornamental Penmanship.

21 SWEETMAN, W. J., *Geelong.*
22 MEYERS, M. E., 75 *Collins-st.*
23 WILLIAMS, GEORGE, *Survey Department.*
24 PUCKEY, JOHN, *Collingwood.*—Grosvenor School Time Table.
25 MEEK, JAMES M'KEAN.—(Lithographed by Hamel and Co.)

Illuminated Writing.

26 WARD, JAMES, *Emerald Hill.*
27 SMITH, G. F., *Williamstown.*
28 HAMEL AND FERGUSSON, *Temple-court and Queen-st.*

Lithography.

DE GRUCHY AND LEIGH, 45 *Elizabeth-st.*—
29 Isometrical Plan (with Key) of Melbourne, 1866.
30 View of Melbourne in 1856.
31 Squatting Map of Victoria.
32 Squatting Map of Riverina.
33 Map of New South Wales.
34 Map of South Australia.
35 Map of New Zealaud.

Wood Engraving.

36 CALVERT, S., *Melbourne.*—Specimens.

Chromo-lithography.

37 HAMEL AND FERGUSSON, *Queen-st.*—From Pictures by E. von Guerard.
TROEDEL, C., 100 *Swanston-st.*—
38 From Pictures by N. Chevalier.
39 Specimens of Chalk Lithography.

TROEDEL, C., 100 *Swanston-st.*—
40 Volume of Show Cards.
41 Views of Victoria.

NO. 4 COMPARTMENT.

Photography.

42 DAVIES, A., 83 *Swanston-st.*—Portraits, coloured in Oils and Water Colours.
ROBINSON, F. W., 16 *A'Beckett-st.*—
43 Views of Melbourne from Post-office Tower.
44 Photographs from Engravings.
DAVIES AND CO., *Bourke-st.*—
45 Portraits, Plain and Coloured, in Oils and Water Colours.
46 Views of Buildings.
47 ELLIS, THOMAS, 45 *Victoria-parade.*—Portraits, Plain and Coloured.
ELLIS, T., AND CO., *Exhibition Building.*—Photographers appointed by the Commissioners of the Intercolonial Exhibition for taking Views of the Interior of the Building and Exhibits, for sale in the Exhibition.
GOULTER, E., 57 *Collins-st. E.*—
48 Portraits, Plain and Coloured.
49 Mezzotint Portraits.
50 PERRY, G. W., 49 *Elizabeth-st.*—Portraits, Plain and Coloured.
NETTLETON, C., *Corner of Madeline and Victoria sts., North Melbourne.*—
51 Portraits, Plain and Coloured.
52 Views, Plain and Coloured.
TURNER, J., 66 *Moorabool-st., Geelong.*—
53 Portraits, Plain and Coloured.
54 Views of Geelong.
55 WINTER, ALFRED, *Bourke-st.*—Portraits, Plain and Coloured.
JOHNSTONE AND O'SHANESSY, 3 *Bourke-st.*—
56 Portraits, plain and coloured.
57 Portraits, mezzotint.
58 PRISTON AND SMALL, *Little Collins-st. E.*—English and Foreign, coloured and plain.
59 DAWSON, PATRICK, *Hamilton and Warrnambool.*—Portraits, life-size, untouched.

SEVERN, H. A., *Union Bank of Australia.*—
60 Stereoscopic Photographs.
61 Microscopic Photographs.
62 M'DONALD, A., *St. George's Hall, Bourke-st.*—Portraits, plain and coloured.
PATERSON BROTHERS, 8 *Bourke-st.*—
63 Portraits, plain and coloured.
64 Views, Buildings, &c.
65 RIDER, A., *Williamstown.*—Portraits, Shipping, &c.
66 DALLIMORE, J. N.—Views on Station. Taken by Exhibitor.
67 CORNELL, F., *Madeline-st., North Melbourne.*—Views in Victoria.
CHUCK, THOMAS, *Daylesford.*—
68 Portraits, plain.
69 Views in Victoria.
70 SHORT, WILLIAM.—Portraits of Children, by patent process.
71 HEWITT, C., 95 *Swanston-st.*—Portraits, in fancy dress.
COMMISSIONERS OF INTERCOLONIAL EXHIBITION.—
72 Photographs, Dublin Exhibition.
73 Photographs of Aboriginal Natives at Coranderrk, near Healesville.
74 NETTLETON, C.—Coloured Photographic Views of Melbourne.
75 WATTS, J., *Warrnambool.*—Marine Polyzoa.
BATCHELDER AND CO., 41 *Collins-st. E.*—
76 Portraits, plain and coloured, and in fancy costumes.
77 Portraits of Governors of Australia.
78 DUCKETT, MR.—Photographs of Sculpture. Unknown.

No. 5 COMPARTMENT.

Drawings, &c.

	EXHIBITOR.	SUBJECT.	ARTIST.
79	NAYLER, B. S.	Sixty Specimens of Painting, in various styles, all painted by Mrs. Nayler—as per catalogue attached thereto	Mrs. Nayler.

Heraldic Painting.

80 MEYERS, M. E., 75 *Collins-st.*—Specimens.
81 STEVENSON, THOMAS, 46 *Latrobe-st. W.*—Specimens.

Drawings.

	EXHIBITOR.	SUBJECT.	ARTIST.
82	FREER, MISS H.	Windsor Castle	Exhibitor.
83	THOMAS, MISS	Clyte from the Round	Exhibitor.
84	—	Head: Gibson's Venus	—

Water-colour Paintings.

85	HOPKINS, R. C.	A Country Cottage, England	Exhibitor.
86	—	Mount Lange Ghian, Victoria	—
87	—	Malvern Hills, England	—
88	—	Sunset, Autumn	—
89	—	Views in Victoria	—
90	GRAY, MRS.	Views of Schnapper Point	Exhibitor.
91	—	View of Queenscliff and Lighthouse	—
92	—	View of Queenscliff and Residence of Hon. Mr. Fellows	—

No. 6 COMPARTMENT.

Oil Paintings—COLONIAL ARTISTS.

93	MARSHALL, JAMES	Refuge Bay, Bass's Straits	Exhibitor.
94	—	Rodondo Island, from Cape Wilson	—
95	—	Coast Scene	—
96	—	Coast Scene	—

	EXHIBITOR.	SUBJECT.	ARTIST.
97	MARSHALL, JAMES	The Junction of the Culterburn with the Dee, Aberdeenshire	Exhibitor.
98	KING, THEO.	Avoca Cricket Ground	Exhibitor.
99	—	Pigs	—
100	BANNER, C.	Dogs	Abbot.
101	RASCHE, W.	View on the Yarra	Exhibitor.
102	STEWART, D.	Christ Healing the Sick	Exhibitor.
103	CHESTER, EARLE	At the Foot of the Cross	Exhibitor.
104	—	An Awkward Pause	—
105	CONROY, MISS	Holy Family	Exhibitor.
106	—	Waterfall	—
107	SUTCLIFF, R.	The Start	Woodhouse.
108	HENDERSON, J.	The Pinnacle Rock, Western Port	Miss E. Henderson.
109	DE CASTELLA, H.	View on the Upper Yarra	Exhibitor.
110	BNIDON, HON. S. H.	Fox Hounds	An Amateur.
111	ACCLIMATISATION SOCIETY	Portrait of Sir Henry Barkly, K.C.B.	Frith.
112	THOMAS, MISS	Portrait of C. Summers, Esq.	Exhibitor.
113	—	Portrait of a Lady	—
114	CROWE, W.	Study: Fruit	E. D. Stuart.
115	GRITTEN, HENRY	Strashmashie Badenoch	Exhibitor.
116	CLARKE, THOMAS	The Last Effort	Exhibitor.
117	TRUSTEES PUBLIC LIBRARY	Jackson's Creek, Sunbury	Henry Gritten.
118	JOHNSTONE, H. S.	Death of Burke	Exhibitor.
119	BATTEN, W. H.	Portrait of a Lady	Miss Thomas.
120	THOMAS, MISS M.	Portrait of a Lady	Miss Thomas.
121	GRITTEN, H.	Landscape	Exhibitor.
122	THOMAS, MISS	Depart du Fiancé (Copy)	Exhibitor.
123	—	Leaving Home	—
124	CUTTS, DR.	Portrait of a Lady	John Calder.
125	PATISON, C. J.	Portrait of a Child	Exhibitor.
126	HENNINGS, S.	View on Yarra, near Melbourne	Exhibitor.
127	LEE, R.	Pawnee Indian Attacked by Bears	Exhibitor.
128	HINGSTON, J.	View on the Upper Goulburn	G. Walker.
129	CAMPBELL, O. R.	Portrait of C. Summers, Esq.	Exhibitor.
130	HINGSTON, J.	View on the Yarra	W. Short.
131	CHEVALIER, N.	Falls on the Wannon	Exhibitor.
132	BINDON, HON. S. H.	The Franciscan Abbey of Quinn—from an origiual Etching	H. Gritten.
133	—	View on the Merri Creek	—
134	CHEVALIER, N.	Fern-tree Gully	Exhibitor.
135	TRUSTEES OF PUBLIC LIBRARY	Buffalo Ranges	N. Chevalier.
136	CHAMP, MISS	Portrait of Earl Chatham (Copy)	Exhibitor.
137	CORDTS, CARL	Landscape	Exhibitor.
138	CHEVALIER, N.	Pine Forest in Italy	Exhibitor.
139	WRIGHT, THOMAS	View of Wuholu Lake, N. Z.	Exhibitor.
140	—	View of the Head of the Waitahuna, New Zealand	—
141	HULL, HON. WILLIAM	Batman's First Meeting with Buckley and the Natives	Woodhouse.
142	M'DOUGALL, R.	Portrait of a Bull	Woodhouse.
143	VAN DEN HOUTEN, H. L.	Waterfall, Riddell's Creek	Exhibitor.
144	—	Dandenong Creek	—
145	—	Burke and King taking Farewell of Wills	—
146	—	Burke, Wills, and King at Cooper's Creek	—
147	RASCHE, W.	Cattle—after Cooper and Lee	Exhibitor.
	—	Cattle—after Cooper and Lee	—

	EXHIBITOR.	SUBJECT.	ARTIST.
148	RICHARDSON, J.	Burke and Wills at Cooper's Creek, unfinished	G. Richardson.
149	CORDTS, CARL	Foxes in the Snow	Exhibitor.
150	—	Landscape	—
151	—	Granite Rocks	—
152	SUTCLIFF, R.	Portrait of "Peggy."	Woodhouse.
153	BUVELOT, L.	Winter Morning near Heidelberg	Exhibitor.
154	—	September Morning, Richmond	—
155	—	Summer Afternoon, Templestowe	—
156	—	View from Botanic Gardens	—
157	—	View near Heidelberg	—
158	—	Showery Day near Brunswick	—
159	—	View in Fitzroy Gardens.	—
160	—	View in Italy	—
161	CHAMP, MISS	Study: Heads	Exhibitor.
162	—	Angel	—
163	VON GUERARD, E.	Large Picture—Mount Kosciusko, seen from the Victorian Border (Mount Hope Ranges).	Exhibitor.
164	—	South-east View from Northern Top of Mount Kosciusko, N. S. W. with Snow on Top.	—
165	—	Cabbage Trees, near the Shoalhaven River, N. S. W.	—
166	—	Tea Trees near Cape Schanck, Victoria	—
167	TRUSTEES PUBLIC LIBRARY	The Mitta Mitta, Victoria. Presented to the Trustees by Hon. A. Michie	Von Guerard.
168	VON GUERARD, E.	Western Mountains near Longford, Tasmania	Exhibitor.
169	REED, THOMAS	View of the Mount Louisa Ranges, from a Track near Mount Guerard	Von Guerard.
170	—	View of Mount Kent, on the Wanangatta in Gippsland	—
171	HENDERSON, J.	On the Buckland	Exhibitor.
172	—	Falls on Bunyarrambite Creek	—
173	—	East Passage, Western Bay	—
174	—	Haystack Rock, Western Port Bay	—
175	HORNE, R. H.	An Incantation	Exhibitor.
176	BATH, MISS E.	Portrait, coloured crayons	Exhibitor.
177	—	Portrait, coloured crayons	—
178	FORD, THOMAS	View on the Terai Plains	Thomas Wright.
179	—	View on the Waitahuna	—
180	—	View on the Woolshed River	—
181	—	View of the Mouth of the Clutha	—
182	HUXLEY AND PARKER	View in Richmond Paddock	L. Buvelot.
183	—	View on the Yarra	—
184	—	View on the Flemington-road	—

Oil Paintings—BRITISH AND FOREIGN.

185	Unknown	Departure of Ulysses	Unknown.
186	SUTCLIFF, R.	Horse	Unknown.
187	BAKER, J., JUN.	Game	Unknown.
188	LOADER, T.	Human Sacrifices	Unknown.
189	POWIS, DR.	Brougham Castle by Moonlight	Pether.
190	LAVERS, R.	St. Jerome	Unknown.

No. 7 COMPARTMENT.

Water Colours.

	EXHIBITOR.	SUBJECT.	ARTIST.
191	RYAN, C.	Vale of Gloucester	J. W. M. Turner, R.A.
192	ALEXANDER, T.	Berne, Switzerland	J. W. M. Turner, R.A.
193	PAIN, H. E.	The Avengers	S. T. Gill.
194	—	Native Police on a Trail	—
195	—	Circumstantial Evidence	—
196	—	Corrobboree	—
197	GILL, S. T.	Native Providore	Exhibitor.
198	—	Bushman's Pastime	—
199	—	The Pipe-light	—
200	—	Opossum Hunting	—
201	GULLY, J.	Storm on the Dividing Range, between Nelson and Marlborough, New Zealand	Exhibitor.
202	—	Western Tier, Middle Island, New Zealand	—
203	AZZOPPARDI, A.	View of Cairo	Exhibitor.
204	—	View of Jerusalem	—
205	DAVIES, H.	View in Tasmania	Exhibitor.
206	COOKE, E. W.	View on the Yarra	Exhibitor.
207	VAN DEN HOUTEN, H. L.	Rose of Denmark	Exhibitor.
208	JARRET, W. H.	Arthur's Seat and Mount Martha	Exhibitor.
209	—	Reeve's River, Gippsland	—
210	—	Mount Wellington, Gippsland	—
211	—	Schnapper Point	—
212	—	Fresh Breeze	—
213	—	Port Jackson	—
214	—	Mount Useful	—
215	—	Mount Disappointment	—
216	GILL, S. T.	Big Manly, Sydney	Exhibitor.
217	—	Little Manly, Sydney	—
218	—	A Stockman	—
219	—	The Inquiry	—
220	HULL, HON. WM.	Swanston-street in 1842	G. Strafford.
221	BARRAND, C. D.	Landscape, New Zealand	Exhibitor.
222	—	View in New Zealand	—
223	—	Landscape, New Zealand	—
224	—	New Zealand Chief	—
225	GULLY, J.	Landscape, New Zealand	Exhibitor.
226	—	View in New Zealand	—
227	LYTTLETON, T. H.	Four Pictures of Horses	Exhibitor.
228	HINES, J. W.	Water-colour Drawing	Copley Fielding.

No. 8 COMPARTMENT.

229	CHEVALIER, N.	Sketches in New Zealand, as per framed catalogue	Exhibitor.

Drawings in Crayon.

230	GHISLIN, W., *Geelong*	Profile of a Lady	Exhibitor.
231	—	Flower and Fruit Stand	—
232	KENNEDY, MISS	Studies of Heads	Exhibitor.
233	VIESSEUX, MADAME	Female Figures	Exhibitor.

Drawings in Chalk.

234	ANDERSON, MISS J. R.	Hesitation—after Calcott	Exhibitor.
235	SAYER, T. W.	Abraham and Hagar	Exhibitor.
236	—	The Nativity	—

	EXHIBITOR.	SUBJECT.	ARTIST.
237	SAYER, T. W.	Magdalene	Exhibitor.
238	BENNETT, W.	Memory and Religion	Exhibitor.
239	NORTON, MISS K.	La Vierge	Exhibitor.
240	—	La Jardiniere	—

Pen and Ink Drawings.

241	ALEXANDER, T.	Vanity Fair	W. M. Thackeray.
242	JAMES, S.	A Visit from Granny	W. M. Thackeray.
243	HOFFMAN, C.	Pawnee Indians Attacked by Bears	Exhibitor.
244	—	The Lord Chancellor	—
245	GRAY, MRS. C.	View of Queenscliff	C. Gray.
246	—	Study: Beech Trees	—
247	—	Gerard Dow's Mother	—
248	MONTEFIORE, E. L.	Distinguished Member of the Humane Society	Exhibitor.
	—	Joan of Arc	—
	—	Melbourne, from the Falls, in 1837	—
	—	Etching in Aqua Fortis	—
249	ROBERTSON, A.	Subject unknown	Exhibitor.
250	NORMAN, W. J.	H.M.S. "Victory" in Portsmouth Harbour	Exhibitor.
251	NORTON, C.	Water-colour Drawing	Exhibitor.
252	BIGNELL, MISS	Water-colour Drawing	Exhibitor.
253	ANDERSON, MISS J. R.	Crayon Drawing	Exhibitor.
254	BLEASDALE, REV. DR.	Ecce Homo!	Guido Reni.
255	—	The Crucifixion	Italian. Unknown.

256 MARTIN, MR.—Eight Lithographic Drawings, from the Dresden Gallery.
257 COWIE, MISS.—Flower Drawings.
258 HENRY, MRS.—Flowers.
259 CAMPBELL, D. C.—Grand Cricket Match played in 1790, between the Earls of Winchelsea and Darnley, for One Thousand Guineas.

NO. 9 COMPARTMENT.

	EXHIBITOR.	SUBJECT.	ARTIST.
260	CLARKE, THOMAS	Spanish Peasant Boys—after the picture by Murillo, in the Dulwich Gallery	Exhibitor.
261	M'CORMACK, MR.	Whiff of the Pipe	Exhibitor.
262	RICHARDSON, G.	Wandering Minstrels of Italy	J. Richardson.
263	WALKER, G.	Study—after Rembrandt	Exhibitor.
264	STUART, W. E. D.	The Battle of Trafalgar	Exhibitor.
265	KENNY, CAPTAIN	Bathing Ship, St. Kilda	T. Clarke.

NO. 10 COMPARTMENT.

266	CLARKE, T.	Portrait of Sir H. Barkly, K.C.B.	Exhibitor.
267	HAYTER, H. H.	Peter Botte Mountain	Exhibitor.
268	—	Peter Botte Peak	—

BRITISH AND FOREIGN MASTERS.

269	BURROWS, W.	Abraham's Sacrifice	Fra Bartolomeo.
270	—	View near Penn, Buckinghamshire	B. A. Steers.
271	—	Holy Family	De Crayer.
272	—	The Gleaner	D. Teniers.
273	—	An Interior, with Still Life	Zorg.
274	—	Man Reading	Jan Steen.
275	—	The Ascension	Caraccii.
276	—	Fruit Piece	De Heem.

	EXHIBITOR.	SUBJECT.	ARTIST.
277	BURROWS, W.	Landscape	Both.
278	—	An Interior	Jan Steen.
279	—	The Philosopher	Quintin Matseys.
280	—	Boy Holding a Candle	Schalken.
281	—	David Lamenting the Death of Absalom	Tintoretto.
282	—	Portrait Charles I.	Vandyck.
283	—	The Wise Man's Offering	M. Carrie.
284	—	Landscape	Salvator Rosa.
285	STEVENSON, W.	Portrait	Rembrandt.
286	TURNER, W. J.	Portrait	Unknown.
287	BLACK, DR. T.	Witch Led to Execution	W. Christie, R.A.S.
288	—	Sheep	Omgang.
289	KENNY, CAPT.	Apotheosis of Lord Nelson	J. Turner.
290	CAMPBELL, D. S.	Rabbits	Unknown.
291	—	Polly Peachum	J. B. Johnston, R.A.S.
292	BLACK, DR. T.	The Letter	D. Teniers.
293	POWIS, DR.	H.M.S. "Pique" Entering Portsmouth Harbour	C. N. Seaforth.
294	LEAKE, R.	The Last Stake	Hogarth.
295	DEASE, E. F.	St. François de Sale	
296	M'BIRNEY, MISS	Les Enfans de Floré	Van Huysam.
297	—	Les Dans de Pomoné	De Bruin.
298	BLACK, DR. T.	Landscape and Cattle	Vervier.
299	DOWLING, ROBERT	Baptism of Christ. Sketch, in oils, by the Artist, of his life-size picture	H. Dowling.
300	TRUSTEES PUBLIC LIBRARY	Don Quixote in his Study	Unknown.
301	—	Gipsy Girl	—

No. 10 COMPARTMENT.

Oil Paintings.

302 Rosebud of England. Baxter.
303 The Rose of England. Baxter.
304 Bunyan in Prison. Folingsby.
305 The Fern Gatherer. Herdman.
306 Head of Our Saviour, in enamel.
307 Depart du Fiancé. Köhler.
308 French Artists in a Spanish Posada. Vibert.
309 Watergate Bay. Mogford.
310 Portrait of a Lady. Unknown.
311 Horses and Pigs. Herring.
312 Martyrdom of St. Sebastian. Unknown.
313 La Belle Yseult. Bedford.
314 Scene on the Hudson. Sontag.
315 Italian Family. Williams.
316 Sheep in Repose. E. Tschaggeny.
317 Departure of the Pilgrim Fathers. — Cope, R.A.
318 Poultry Vendor. Von Schendel.

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Sculpture.

	EXHIBITOR.	SUBJECT.	ARTIST.
319	TRUSTEES PUBLIC LIBRARY	Bust in Marble of Sir Henry Barkly, K.C.B.	C. Summers
320	—	Bust in Marble of Sir Redmond Barry, Knight	
321	SUMMERS, C.	Bust of Sir Charles Darling, K.C.B.	Exhibitor.
322	HORSLEY, C. E.	Medallion Portrait of himself	Miss Thomas.

EXHIBITOR.	SUBJECT.	ARTIST.
323 DUCKETT, T.	Medallion Portrait of E. Von Guerard, Esq.	

Oil-colour Paintings.

EXHIBITOR.	SUBJECT.	ARTIST.
324 THOMAS, Miss	The Quadroon Girl	Exhibitor.

THE QUADROON GIRL.

Before them, with her face upraised,
In timid attitude,
Like one half curious, half afraid,
A Quadroon maiden stood.
Her eyes were large and full of light,
Her arms and neck were bare,
No garment she wore save a kirtle bright
And her own long raven hair.—LONGFELLOW.

EXHIBITOR.	SUBJECT.	ARTIST.
325 DOWLING, ROBERT	Portraits of their Royal Highnesses the Prince and Princess of Wales, from actual sittings	H. Dowling.

WEST-END ROOM.

No 11 COMPARTMENT.

Engravings and Architectural Court.

BLUNDELL AND FORD, *Printers*, 51 *and* 53 *Flinders-lane W.*—

326 Portrait of His Excellency Sir John Henry Thomas Manners-Sutton, K.C.B. Wood Engraving. Printed on satin by the Exhibitors.

327 Design for the New Town Hall, Melbourne. Wood Engraving, tinted. Printed on satin by the Exhibitors.

328 ELLEKER, W. H., *Emerald Hill.*—Designs for Parliament Houses, Brisbane; Designs for Buildings.

329 NOONE, C., *Crown Lands.*—Specimens of Photolithography.

330 ROBINSON, F. W.—Specimens of Photolithography.

331 CROUCH AND WILSON.—Architectural Designs and Drawings.

332 FERGUSON, URIE AND LYON.—Stained Glass Designs for Windows. Public Works Department, Post-office, and Public Offices.

333 CAMPBELL, D. S.—Engravings, Exterior and Interior of the Old Royal Exchange, London.

334 BLACK, DR. THOMAS.—Oliver Cromwell and his Daughter.

335 BLACK, DR. THOMAS.—Michael Angelo and Raphael in the Vatican.

336 SURVEY DEPARTMENT.—Physical Map of Victoria.

337 RASCHE, W.—Architectural Drawings.

338 AUSTIN, T.—Architectural Drawings.

339 DAVIDSON, C., *Rokewood.*—Architectural Drawings.

340 WYNN, JAMES, *Inglewood.*—Architectural Drawings.

341 PEARSON, G. B., *Dunolly.*—Plan of Floating Battery.

342 CROUCH AND WILSON.—Architectural Designs and Photographs of Buildings.

343 BILLING, N.—Architectural Drawings.

344 MATTHEWS, P.—Architectural Drawings.

345 SCHOBS, J.—Lithographs.

346 SMITH AND WATTS.—Architectural Drawings.

347 VICKERS, C.—Architectural Drawings.

348 RUMSEY, E., *Auckland.*—Photograph.

349 WRIGHT, THOMAS.—Wesley College.

350 NUTT, T. W.—Designs.

351 REED AND BARNES.—Perspective Elevation of the New Town Hall, Melbourne; also, Perspective Elevation of the New Congregational Church, corner of Russell and Collins streets, Melbourne.

352 SCHOLES, J. S., 3 *Nicholson-st.*—A Chronological Chart of the Kings of Judah and Israel; a Diagram of the Seven-sealed Book of the Apocalypse. Drawn by Exhibitor.

353 SUTCLIFF, R.—Freemasons' Hotel, Brighton.

Photographs.

354 NETTLETON, C.—Photograph of Chinese Carved Altar-piece.

Lithographs.

355 BLACK, DR. T.—The Onconvanienoe of Single Life.
356 BLACK, DR. T.—A Raal Convanience.

ROTUNDA.

Sculpture.

	EXHIBITOR.	SUBJECT.	ARTIST.
357	THOMAS, MISS	Portrait Bust of a Lady	Exhibitor.
358	—	Medallion Portrait of a Lady	—
359	—	Medallion Portrait of a Lady	—
360	—	Group: Disinterested Friendship	—
361	—	Cameo Portrait from Life	—
362	STUMBUCO, MR.	Figure: The Virgin	Exhibitor.
363	—	Bust of Pope Pius IX.	—
364	—	Bust of Daniel O'Connell	—
365	SCURRY, J.	Bust	
366	—	Medallions	
367	—	Figure: Francesca	
368	VEROLI, L.	Six Groups, in marble	Unknown.
369	HUXLEY AND PARKER	Figure in marble	Gilbert.
370	NUTT, T. W.	Medallion Portraits	Exhibitor.
371	DERRICK, E.	Portrait Bust	T. W. Nutt.

372 KELLY, MISS.—Cameos, &c.: Queen and Prince Albert.
DEGRAVES, HON. W.—
373 Two Bronze Castings from Berlin.
374 Stags. (Fountain Court.)
375 The Amazon.
376 Two Lamp Stands.
377 Centrepiece on Wright's Fountain. (Machinery Court.)

MEDIÆVAL COURT.

378 BLEASDALE, REV. DR.—Crucifixion, painted on three folding panels.
379 KELLY, MISS.—Medallion Portrait.

ADDENDA.

Water Colours.

	EXHIBITOR.	SUBJECT.	ARTIST.
380	MILLS, H.	Landscape—Park Entrance	Exhibitor.
381	—	View of Bramber, Sussex	—
382	—	Landscape Composition	—
383	—	View of Ben Lomond	—
384	—	Landscape Composition	—
385	—	Landscape Composition	—

Oil Painting.

386	MILLS, H.	Village in Kent	Exhibitor.
387	BINDON, HON. S. H.	Interior of a Church	Unknown.
388	WATERMANN, MR.	Monk	Suyers.
389	BINDON, HON. S. H.	The Goodman	Holbein.
390	—	Dutch Peasants	Unknown.
391	TRUSTEES OF PUBLIC LIBRARY	May Morning in Warwickshire	Richardson.
392	HINES, J. W.	Landscape	Blacklock.
393	PANTON, J. A.	Spanish Boy with Flageolet	Murillo.
394	MONTEFIORE, E. L.	Etchings	Exhibitor.
395	LEE, R.	Bush Scene in Australia	L. Walsh.

	EXHIBITOR.	SUBJECT.	ARTIST.
396	LEE, R.	Bushmen and Horse	L. Walsh.
397	JARRET, W. H.	Mount Steel	Exhibitor.
398	ROBERTSON, A.	Pen and Ink Drawing	Exhibitor.
399	KNIGHT, J. G.	Melbourne, from the South Side of the Yarra Yarra	
400	HORNE, R. H.	Royal Military College, Sandhurst	Exhibitor.
401	ACCLIMATISATION SOCIETY	Portrait of Sir Henry Barkly	Batchelder and Co.
402	NAYLER, B. S.	Bear Fight—the original from which so many have appeared in England	Snyders.
403	GRITTEN, H.	Landscape	Exhibitor.
404	WIGMORE, E.	Sketch	Exhibitor.
405	—	Winter Scene	—
406	—	Sketch	—
407	—	Landscape	—
408	NAYLER, B. S.	Solomon Worshipping in the Temple of Diana	Gerrard Lairesse.
409	—	Baiting Place	Wouverman.
410	LOKER, W. H.	Four Water-colour Drawings	Exhibitor.
411	CLARKE, MR.	Naughty Boy	Unknown.
412	NEWTON, H.	Family Portraits	Sir Peter Lely.
413	GEELONG TOWN COUNCIL	Views of the Town and Suburbs of Geelong, and Statistics relating thereto	
414	BUVELOT, L.	Study, in oils	Exhibitor.
415	—	Study, in water colours	—
416	VEROLI, L.	La Mendicante; or, The Beggar	Unknown.
417	DUCKETT, T.	Photographs of Statues	Exhibitor.
418	CAMPBELL, R.	Falls of the Hopkins River	A. Ramage.
419	CLARKE, W.	Scene in Norway	Unknown.
420	MILLAR, G. S.	Plan of Patent Apparatus for Preventing Boiler Explosions	Exhibitor.
421	PUBLIC WORKS DEPARTMENT	Designs for Public Buildings	A. Snow.
422	ELLERY, R. L. J.	Progress Plan of Geodetic Survey of Victoria	
423	FUSSELL, JAMES	New Map of Australia	Exhibitor.
424	WEBB, CHARLES	Warehouses in Flinders Lane	Exhibitor.
425	—	Front Elevation of Orphan Asylum	—
426	—	Residence of Hugh Glass, Esq.	—
427	—	Church of England Grammar School	—
428	—	Design for a Church	—
429	THE BOROUGH COUNCIL OF HOTHAM	Panorama of the Borough of Hotham	G. M. Hardess (Amateur).
430	THE CORPORATION OF THE CITY OF MELBOURNE	Panoramic Views of the City, taken from the Tower of the Post-office	Nettleton.
431	CHATTERTON, MR.	Homely Fare	Unknown.
432	BLACKBURN, J.	The Morning Ride	Unknown.
433	—	Fruit Piece, in water colours—after G. Lance	

434 CHUCK, T., *Daylesford.*—Photographic Albums, Stereoscopic Views.
435 WALTERS, MR.—Portraits of Aborigines. Presented by Mr. Walters to the Commissioners.

[The specimens of Australian Natural History arranged around the Fine Arts Gallery were collected and prepared by Mr. and Mrs. H. E. Pain. They have all been collected within the last sixteen years.]

FINAL ADDENDA.

Class.	Section.	
I.	1	Dunolly Borough Council.—Block of Granite and other Stones.
I.	1	Huxley and Parker, Melbourne.—Two large blocks of Granite, from Harcourt.
I.	1	Lyons, J. C.—Lignite and Peat Specimens.
II.	4a	Wakely, Mr., Beechworth.—Silk.
II.	4a	Foord, J., Wahgunyah.—Silk.
II.	4b, 12c	Peters, Mr., Dunolly.—Candles.
II.	8	Professor M'Coy.—Baleen of Whalebone, Whale of Victorian Seas, and Illustrations of the Zoology and Palæontology of Victoria. Executed by A. Bartholomew.
III.	7	Patterson, Thomas, New South Wales.—Medicinal Herbs.
III.	7	Robertson, J.—Specimens of Dyed Cloth.
III.	7b	M'Kendrick and M'Ewan, Melbourne.—Large Plank of Cedar, measuring 12½ feet by 4½ feet by 2½ inches.
III.	7b	Hill, W., Government Botanist, Queensland.—Collection of Timber Specimens.
III.	7c	Marsden, Mr.—Strong Coarse Flax, for Cordage.
III.	7, 8	Young, John, Melbourne.—Sample of Tartarian Oats.
III.	9	Weber Brothers, Geelong.—Pineau and Riesling Wines.
III.	9	Bear, T. H., Plenty, Yan Yean.—White Wine, sixteen years old.
III.	9	Hewitt, J., Richmond.—One dozen White Wine.
III.	9	Nixon Brothers, Murrumbidgee, New South Wales.—Red Wines.
III.	9a	Field, Mr., Nelson, New Zealand.—Bulk Bitter Ale.
III.	9a	(sub-section) Levy, J., and Sons.—Spirits of Wine.
IV.	12b	Harris and Heymanson.—Colonial Boots and Shoes.
IV.	12b	Rolls and Son.—Youths' and Men's strong Colonial Boots.
IV.	13, 14	Webb, Joseph, Nelson, New Zealand.—Colonial Tweeds.
V.	16	Arch, Samuel.—Bracket of Wrought Iron.
V.	16	Wilkie, Mrs.—Groups of Sea-weed, in Stands carved from Cuttle Fish.
V.	16	Fergusson and Mitchell.—Illuminated Writing—"The Brooke Memorial."
V.	16	Carter, C.—Writing on Glass.
V.	16	Foster, Mr.—Altar Cloth.
V.	16a	Gaul, J., Melbourne.—Untouched Photographs.
V.	16a	Felton, Thomas, Sydney, New South Wales.—Untouched and Tinted Portraits.
V.	16a	Poochee, Mr., Queensland.—Panoramic View of Ipswich.
V.	16a	Crawford, F. A., Adelaide.—Photographic Views of the City of Adelaide.
V.	16a	Phillips, Mr., Perth.—Panoramic View of Perth, and other Photographs.
V.	16a	Hoby, G.—Untouched Portraits of Maories.
V.	16a	Hardess, Mr., Melbourne.—Panoramic View of Hotham.
V.	16a	Hewitt, C., Melbourne.—Untouched Photographs.
V.	16a	Joseph, R., Melbourne.—Photographic Views.
V.	16a	Macdonald, A., Melbourne.—Untouched and Mezzotinto Portraits.
V.	16a	Norton, Charles, Geelong.—Photographic Views.
V.	16a	Ormerod, Mr., Queenscliff.—Photographic Views.
V.	16a	Nelson and Co., Bathurst, New South Wales.—Photographic Views.
V.	16a	Frith, Frederick, Melbourne.—Photograph (Sennotype).
V.	16a	Turner, W. J., Beechworth.—Portrait, by Raphael.

Class.	Section.	
V.	18	Lovell, W., Melbourne.—Sideboard of Blackwood.
V.	18	Commissioners of New South Wales.—Show-case for displaying wines.
V.	19	Wilson and Mackinnon, *Argus* Office.—Bound Copies of *Australasian* and other works.
V.	19	Brown, Francis, Footscray.—Parchment. Manufactured by Exhibitor.
V.	19	Nicholls, A., Sydney, N.S.W.—Set of Writing Books.
V.	20, 21	Nicholas, W.—Working Mining Sections of the Catherine Reef United Claimholders Gold Mining Company (Limited), Sandhurst.
V.	20, 21	Rodgers, John, Kingower.—Diagram of Vessel, sailed by Windmills.
VI.	22a	Houghton, W. G., Richmond.—Perambulators.
VI.	23a	Greening, Benjamin.—Geodetic Survey Apparatus.
VI.	23a	Skilton, R. J.—Heliostat.
VI.	23a	Rasche, W.—Planimeter, by Exhibitor.
VI.	23b	Weber, A.—Check-action Pianoforte, in rosewood case, manufactured by Exhibitor.
VI.	24	Kerr, J., Hunter.—Model of Drafting Yards for Sheep.
VI.	25	Steel, Thomas.—Model of Ship.
VI.	25a	Jolly, Wm., and Co., New South Wales.—Specimens of Building Timber.
VI.	25b	Lavater, G. T. A., St. Kilda.—Guns and Projectiles, Vent Piece for Guns.
VI.	25b	Sargood, Captain.—Three Presentations of Whitworth Guns.
VI.	27	(sub-section) Mueller, Dr. Ferdinand.—Collection of Victorian Aboriginal War Implements.
VI.	27	(sub-section) Ridley, Rev. W.—Kamilaroi, Dippel, and Turrubul Languages, Spoken by the Australian Aborigines.
VI.	27	(sub-section) Abbott, John.—Busts of Tasmanian Natives.
VI.	27	(sub-section) Dowling, H., Launceston.—Busts, Models of Tasmanian Aborigines.

ADDENDA TO THE AWARDS.

Sub-section 27 a.—Miscellaneous.

MEDAL.

— **Bateman, E. L., for his most artistic designs for the decoration of the Great Hall and Vestibule of the Exhibition.**

HONOURABLE MENTION.

501 Brock, H., Richmond.—For Signal Rockets, Blue Lights, and other pyrotechnic productions.

502 Buckham, John, Elizabeth-street.—For useful improvements in the manufacture of Tents.

516 Hart, Samuel, Collins-street East.—For Toys and Croquet Materials of colonial manufacture.

861 Marshall, George, Collins-street East.—For Colonial-manufactured Cricketing and Archery Goods.

COMPANION TO THE OFFICIAL CATALOGUE.

GUIDE

TO THE

INTERCOLONIAL EXHIBITION OF 1866-7.

INDEX.

INTRODUCTORY.

To those who remember the glories of the Great Exhibition of 1851, the model of all succeeding enterprises of the kind, the undertaking which has been brought by the Victorian Commissioners to so successful an issue will not present very formidable proportions. Contrasted on the other hand with previous attempts of a like character in this city, there can be no doubt that this gathering of 1866 assumes an importance it would be difficult to overrate. But without entering upon comparisons, either detrimental or flattering to our pride as a nascent nation, it may be safely alleged that it has been made evident that the Exhibition is quite sufficiently large to prove puzzling to visitors unable to devote much time to its inspection, or ungifted with the faculty of systematic application. Persons have visited the place more than once, and for hours together, and have subsequently found on comparing notes with friends that multitudes of objects, well worthy of attention, have escaped their view. To assist such visitors in making a more comprehensive survey of the buildings, and to prove a Hand-book to the Exhibition, more interesting and generally acceptable than a dry catalogue, constitutes the modest object of this little publication.

We will first lay down clearly the line of march we propose to adopt. Entering the building at the visitors' porch in Latrobe-street, we shall proceed at once into the Main Hall, and turning sharp to the left, find ourselves in the Mediæval Court, where our inspection commences. Passing through this court, we shall travel right down the left avenue of the Hall, and come round the pillars back, then down by the left centre, through the fur trophy which meets the eye on entering the room; we shall proceed back again by the right avenue, passing round each intercolonial court on our way, and taking a trip into the gallery to obtain a bird's-eye view of by far the finest hall constructed in Australia. This completed, we shall find ourselves once more by the Mediæval

Court, and shall leave the Main Hall and enter the Machine Room, which runs along the northern side of the pile. This most instructive apartment we shall circumnavigate, and overlapping our course a little, pass out of it by the central door, leading into the Northern Fountain Court. This will bring us to the northern entrance to the Octagon, where we shall turn sharp to the right, and inspect it first by the outer circle and then by the inner; leaving this—one of the most elegant rooms of the series—by the door, which enables us to cross the Hall, and proceeding, without turning to the right or left, into the Annexe, we shall advance straight up the centre of this corrugated iron structure, and out through the left wing, which, in consequence of pressure of space, as the printers say, has been extended as far as Russell-street. Returning down this wing, we shall take a peep at the large space of open garden, where the flower show recently took place, and others have yet to be held; and then, re-entering the Annexe, turn to the right hand, and travel round it, and, re-traversing the central pathway, return to the Hall. Taking the "left wheel," we shall come to the entrance to the Picture Gallery, which runs along the south of the pile, balancing the Machine Room on the north. After making the circuit of the Picture Gallery, we shall descend the steps leading to the basement, where are located the large and delightfully-cool Refreshment Rooms, and shall find at the extreme end of the corridor apartments containing more exhibits, in the shape of wines, ales, and cured meats. A retrogressive movement from this point will bring us to a flight of stairs, by ascending which we shall reach the Southern Fountain Court, and re-enter the Octagon by the door opposite to the one through which we first came upon it. This will complete our tour of the Exhibition.

GUIDE

TO THE

INTERCOLONIAL EXHIBITION OF 1866-7.

THE MAIN HALL.

On entering this hall from Latrobe-street, visitors who put themselves under our guidance will find, by turning immediately to the left before arriving at the fur trophy, which faces them, that they have come upon perhaps the last thing one might expect to encounter in an exhibition of the products and manufactures of a new colony—to wit, a Mediæval Court, the whole of the decorations and contents of which are the work of two Melbourne houses, the one that of Mr. John Young, contractor, and the other that of Messrs. Ferguson, Urie and Lyon, glass-stainers, &c. The excellence of this court consists not more in the beauty of the various articles it contains than in the admirable tone of all the decorations, giving to the place that "dim, religious light" befitting the character it assumes. The stained-glass windows let into the partitions surrounding the court are mainly instrumental in producing this effect. The court is filled with statuary, fonts, and elaborately-ornamented wrought-iron articles, suitable for mediæval church purposes. One of the statues represents the Madonna and Child; others personify St. John, St. Thomas, and St. Theresa. Attached to the walls near the roof are several of the quaintly-carved figures which catch the eye in old churches. These are intended for St. Patrick's Cathedral, now in course of erection on the Eastern Hill. To complete the ingenious effect of this court as a complete work of art, Messrs. Ferguson, Urie and Lyon have constructed at the side opposite the entrance a recess representing an early English chancel, the decorations of which are most complete. The furniture of the chancel consists of an altar table, an illuminated oil painting of the Last Supper, and illuminated tablets of the commandments, creed, and Lord's Prayer. The light admitted to the chancel pours through five stained-glass windows, representing respectively the Nativity, Passion, Crucifixion, Resurrection, and Ascension. These are designed for the Episcopalian Church at Casterton. The walls are also artistically decorated, and altogether this chancel, with the court leading to it, make up one of the most remarkable objects of the Exhibition.

Passing out through an angle of the Mediæval Court, we come upon a nicely-arranged set of bedroom furniture, designed and manufactured by Messrs. Beauchamp and Rocke. There are wardrobe, drawers, wash-stand, toilet table, swing glass, pier glasses, chairs, &c. The window

lighting up this corner of the Hall is elegantly curtained by the same firm, so as to complete the effect. The furniture is principally of Huon pine and blackwood—two of the most useful woods which this part of the world yields. The Huon pine comes from the banks of the river of that name in the south of Tasmania, and the best of the blackwood is brought from the island colony. The chess-table ottoman is sure to attract attention here as well as further down the same avenue, where one capable of separation into two easy chairs is exhibited by Mr. D. M. Crowley. For a good part of the way down the left-hand side of this avenue are exhibited elegant suites of drawingroom furniture by various makers, in inspecting which, however, the visitor must not forget to lift his eye to the wall above, where various articles worthy of attention are hanging. The windows also are utilised for the purpose of displaying specimens of stained and ground glass, some of the latter the product of a Ballarat manufacturer. At the right-hand side, a case of valuable Australian furs from Mr. Hart's repository challenges notice. A little further on, among the furniture exhibits, is a beautiful cheval drawingroom screen, embroidered in floss silk on white satin, which will bear comparison with the best foreign work of the kind. The billiard tables from Mr. Alcock's manufactory form too conspicuous a feature of this portion of the building to be readily overlooked. They are (with the exception of one portion of them) of colonial materials, even to their beds, the slate for which is obtained in the neighbourhood of Castlemaine. The wood principally used is that most valuable of all our indigenous timbers, blackwood. Mr. Alcock has immense quantities of this wood in his yard in various stages of seasoning. The bulk of it, as we have said, comes from Tasmania, in the court of which colony a magnificent specimen is displayed. One of Mr. Alcock's billiard tables is left without a cloth, so that the slate bed may be seen. The cloth, by the way, it should be mentioned, is the exception to which reference has been made, as up to the present time it cannot claim to be a local manufacture. Above the tables are fitted lights of an elegant design. Cues and rests, together with spiral columns and other specimens of wood turning, are placed upon the tables. Passing some elegant sets of drawingroom furniture, the visitor may be apt to overlook a central ottoman standing by itself, less elegant, perhaps, than comfortable-looking. It is possessed of this novelty, that by the withdrawal of two or three iron rods it can be converted into two couches and two easy chairs. On the walls above are slabs of grained wood by Ellimore, so well executed that it is difficult to distinguish them from the productions they represent.

On the right-hand side of this avenue, and ranged in cases around the pillars, is to be found the collection of the Victorian Mining Department. This includes minerals from all parts of the world, as well as the almost exhaustive collection illustrative of the mineralogy of this colony. Special catalogues of these exhibits can be obtained by the visitor, together with an essay on the subject from the pen of R. Brough Smyth, Esq., to whose patient exertions the excellence and completeness of the collection is mainly due. For the benefit of those who may not be disposed to have recourse to this source we extract from the *Argus* an abbreviated notice of the collection :—

Beginning with the cases, we may point to Nos. 9 and 2858, from the claim of Messrs. Lewis and Menzies (the former the prospector), situated on Balaclava Hill, Whroo. The hill is one mass of sandstone, intersected more or less thickly

by auriferous quartz veins, and the main workings at present in operation consist of a large open cutting. The specimens are taken from depths varying from 50 to 330 feet, and some of the quartz yielded thirty ounces of gold to the ton. Here, too, are exhibited a fair number of Victorian gems—such as zircons, sapphires, &c., from Blue Mountain, Berwick, Loddon River, and elsewhere. No. 254 includes specimens of granite from Nuggetty Reef, Maldon. The granite shows its junction with the metamorphosed slate and the intersecting veins of quartz. The distribution of the minerals composing the granite is often peculiar, and the gold is disseminated in the small veins of quartz in such a manner as to compel the miners to send the granite itself as broken out of the mine to the mills. Pyrrhotine and other forms of iron pyrites are found in this locality. The whole of these specimens are very interesting. No. 322 forms a collection of rocks and minerals illustrative of the geology of the Upper Murray basin, collected by Mr. C. E. Hodgkinson, C.E., Assistant Commissioner of Lands and Survey. The collection includes some fine crystals of tourmaline in quartz, and two specimens of fossil unio. The chief value of the collection is, however, that it explains and illustrates Mr. Hodgkinson's "Observations on the Geology and Soil of the Country adjacent to the Upper Murray, and also on the Development of the Productive Capabilities of that Portion of the Territory of Victoria," published by the Victorian Philosophical Institute (now the Royal Society), in 1855. No. 320 is a fine specimen of Cape Paterson coal, about four feet long and 2 feet thick, from Mr. T. Bury's coal claim in that locality. No. 348 is a curious piece of New Zealand jade, or greenstone (hydrous silicate of magnesia), the property of Mr. S. H. Bindon. This mineral is found massive and in blocks, with slate and limestone, in many parts of the world. In India, axe-heads and ornaments are manufactured from it, and vessels made from the material are found to be as sonorous as porcelain. In New Zealand, and indeed in many parts of the South Seas, the natives fashion jade (or nephrite) into all kinds of fantastic shapes, hatchets, ornaments, &c., of which the specimen accompanying may be taken as an excellent example. In the New Caledonia Court some splendid native weapons of this material may be found, together with a huge block of a light green colour, closely resembling jade. No. 496 indicates a case entirely devoted to some promising specimens of native copper, sulphides, oxides, carbonates, and grey copper ores, from the claim of the Thompson River Copper Company, above forty-five miles from Sale, North Gippsland. Many are very fine and large, consisting of blue and green carbonates of copper and hematite, &c., yielding, it is said, a return of from 20 to 50 per cent. of pure copper. The lode is understood to have been traced for several hundred feet, is eighteen feet wide, and worked to a depth of 40 feet. According to account-sales rendered, it would appear that 18 tons 15 cwts. of copper ore were delivered by the company to the English and Australian Smelting Company's works at Adelaide, and the percentages agreed upon for the four parcels were respectively 20¼, 18¾, 17, and 19¼, equal to 3 tons 9 cwt. 2 lbs. of copper, or 349 units, of the value of £246 1s. 3d. At this point we may mention that several fine slabs of slate, from the Moorabool Slate Quarries, are exhibited in the North Fountain Court. Of native lead there are two entries, Nos. 414, 415. The first came from the gold-bearing drift in the claim of the Mount Greenock Great Extended Gold Mining Company, on the main course of the Mount Greenock Lead, the particles being more numerous towards the heart of the mount. They were presented by Mr. E. J. Bateman, of Talbot. The second exhibit is a specimen of lead found with fine gold, the gold appearing to have been taken up while the lead was molten. They were in great quantities in the claim of the Avoca Deep Lead Mining Association, in the gutter, and are very rare and valuable. Part of the lead was washed from three tubs of washdirt. From the Clunes come, in addition to numerous specimens of auriferous quartz, two specimens of "flucans," found in the centre of the western reef, at the 200 feet level. They were presented by Mr. R. H. Bland, and are derived from the Clunes Quartz Mining Company. In separate small cases will be found three exhibits of great value, sent by Mr. W. H. Gaunt, warden at Beechworth. The first is No. 522, and is composed of washdirt, containing gold and stream tin, taken from a depth of 75 feet; thickness of layer of washdirt, three feet. It came from Messrs. Kneebone and Co.'s amalgamated claim, Eldorado Flat, Woolshed Creek. The second, No. 523,

is stream tin, taken from a depth of 15 feet from the surface, said to yield 75 per cent. of tin, and to be worth £40 per ton, in addition to an average yield of 90 ounces of gold per ton. A cubic yard of washdirt yields about two to two and a half ounces of gold, and half-hundredweight of tin ore. It is derived from Gitt's claim, Napoleon Flat, Woolshed Creek. The third, No. 524, is also stream tin, taken from a depth of thirty feet from the surface, said to yield 65 per cent. of tin, and to be worth £37 per ton, in addition to an average yield of 75 ozs. of gold per ton. A cubic yard of washdirt yields about 3¾ ozs. of gold and 1 cwt. of tin. It comes from the Endeavour Claim, Eldorado Flat, Woolshed Creek. Ingots of smelted tin ore from Beechworth are also exhibited; and beneath two of the long specimen cases are two large blocks of fossil wood from the Ballarat deep leads. A few specimens of carbonate of copper, from the Quedong Copper Mining Company's claim, Twofold Bay, cannot but attract notice; as well as several samples from the different levels of the St. Arnaud Silver Mines Association, St. Arnaud; bismuth from the Dandenong goldfields, and carbonate of bismuth from Ramshorn Gully, Sandy Creek, Maldon. There may also be seen basalt, showing the strata sunk through by the Great Redan Extended Company, Ballarat; kaolin from the Dunolly Porcelain Company, sent by Mr. J. C. Paterson; chalcedony from Morocco Valley, Gippsland; and agate from Cape Otway. The collection made by the Geological Survey of the colony is at once remarkable and varied. It is included in Nos. 423–487, and among other more familiar minerals are cerusite, with galena, iron, and arsenical pyrites, from Wilson's Reef, St. Arnaud; mimetene from the same place, valentinite from Woodspoint, psilomelane from Strathloddon, diallogite from Clunes, micaceous iron ore from the Grampians, brown iron ore from Moonee Ponds, titaniferous iron sand from the Upper Yarra, chromic iron sand in small octahedrons from Heathcote Creek; wolfram from Sandy Creek, Maldon; spathic iron or chalybite from Lisle's Reef, Maldon; sphærosiderite from Campaspe River; pyrrhotine with arsenical pyrites from Maldon; pharmacosiderite from Clunes; copperas from Beehive Reef, Maldon; felspar from West Australia, the Anakies, Malmsbury, Fryerstown, and Gippsland; talc from Heathcote, obsidian from Geelong and the Western Plains; and zeolites, zircons, corundums, almandine, garnets, &c., from various parts of the colony. From the Major's Ranges, Benalla, are sent by Mr. H. B. Nicholas, the mining surveyor, a small and a large specimen of hydrated peroxide of iron, and Mr. Nicholas states that there is an almost unlimited supply of similar material cropping out from the surface. The same gentleman has sent specimens of limestone (Nos. 33 and 244) taken from the vicinity of the samples of iron just mentioned, and the limestone deposit appears to be very considerable.. An unusually fine specimen of sandstone from the Grampians, fourteen miles west of Stawell, has been sent by Mr. W. G. Couchman, mining surveyor of Inglewood. It is numbered 489. On one of the pillars opposite to the auriferous quartz is hung a map of the colony of Victoria, showing the mining districts and divisions, also the alluvial workings and quartz reefs. As a piece of workmanship it may be said to be equal to the maps by Major-General Colby, of the ordnance survey of Great Britain. It also has the merit of being admitted as the most accurate of the maps of Victoria yet published. Mr. A. B. Ainsworth, mining surveyor, of Woodspoint, has also sent a map of that mining division, which is hung on the other pillar. It would be difficult to find any map of any mining division in the colony on which the boundaries of the claims, leases, reefs, and alluvial workings are laid down with more apparent carefulness. Numerous Victorian fossils from the goldfields are also offered for inspection.

Independent of the large collection of the Mining Department in cases, there are magnificent specimens of quartz exhibited in this portion of the building, near to the entrance to the annexe. A small case, stationed a little further down the same avenue, is contributed by the St. Arnaud Silver Mining Company, the arrangement of which deserves special attention. The specimens in it are so located as to show the dip of the various lodes and the character of the stuff lighted on. A still smaller case in this neighbourhood is somewhat obscurely situated, and might,

although containing some elegant specimens of quartz gold, escape notice. It is among the Sandhurst goods, and its contents are the product of the North Whip Reef, and contributed by Mr. George Elliott.

The lower half of this avenue, beyond the annexe entrance, is chiefly devoted to the provincial exhibits, which are of a heterogeneous kind. Coming first upon Sandhurst, we find, besides the frames of photographs which are common to all the courts, and some of which are executed in a superior manner, models of mining implements, specimens from the gold claims, and natural products innumerable. A box of gum taken from the acacia, greatly resembling gum arabic, is contributed by Mr. Holdsworth, of Pall-mall, together with samples of beeswax and white seal bottling wax. There is also here what is termed a self-acting fountain; but as the action is not going on, and there is not up to the present time any description of its *modus operandi*, the visitor is left in the dark as to its peculiarities. A collection of pebbles and stones, made by Mr. G. Longbridge, comprises a considerable variety of valuable specimens. The Alabama Company have sent a beautiful quartz specimen. Among the homely articles here, some most useful ones in the shape of leathers and clayware will be found. The former are from the establishment of Messrs. Goudge and Sibley; the latter from the pottery works of Mr. Guthrie, at Epsom. These comprehend, among other things, those large stone bottles and jars which are required for so many manufacturing and domestic purposes, and which hitherto the colony has imported from the other side of the globe. Opposite these are handsome cases, containing stuffed birds from the Sandhurst district, contributed by Mr. John Slocombe, and three or four paintings by Mrs. Thunder, which will well repay inspection.

The next compartment we come to contains the exhibits forwarded from the Beechworth district, a most admirable collection as showing the resources of the locality, if not attractive in outward aspect. One of the first exhibits we meet on the left-hand counter is a rough, but doubtless efficacious, still for perfumery. It was moulded by hand by the exhibitor, Mr. P. J. Martin. Side by side with this is another novelty, the product of the inventive genius of the district, to wit, some patent horse-shoes, designed by Mr. Samuel Taylor. The peculiarity of these shoes consists in the fact that the upper portion of them is expansive, and yields to the pressure of the horse's foot like the hoof itself. They are said to be advantageous, especially in leaping. Patent stirrups, which readily allow the foot of the rider to escape from them in the event of accident, and patent hooks for hoisting, made so as to close the more tightly the greater the weight placed upon them, are contributed by Mr. Macabe, of Chiltern. Samples of sea-island and New Orleans cotton, grown on the Ovens, will be noticed next, adjoining several small slabs of the Murray pine. The latter form a section of an excellent collection of woods from the Ovens district. Leaving a complicated geographical clock and altiscope of Mr. Cuzner's to be investigated by the curious in such matters, we pass on to inspect the samples of grain and flour. Among the former will be found Ovens canary seed, grown by Mr. Jeffrey, Gardiner, and much fine wheat, oats, &c.; among the latter, samples of flour most creditable to the local millers. Malt, dried fruits, and jams of all kinds will also be found amongst the products of the district, among which, of course, the wines make a good show. A good case of Ovens gems, set in Ovens gold, is

exhibited by Mr. W. J. Turner; contiguous to which are cases of birds and reptiles, which are not likely to escape notice. One pretty little exhibit in the neighbourhood consists of a branch of eucalyptus, on the leaves of which landscape views are painted in oil colours. Some large tobacco leaves, grown at Wangaratta, are shown here, which appear to be of good quality; also, glue of local manufacture.

Another step brings us among a lot of Ballarat exhibits, and we are surrounded by slates and woods, furs and confections. Mr. Stevens exhibits furs; Mr. Taylor, biscuits and *bon-bons;* Mr. Shepperd, embossed glass—all of fair quality; but the article which will most likely catch the eye of the visitor is a case containing seventy-two birds, well stuffed and mounted. After having looked at this, however, let us turn to something less showy, but more useful—the saddlery. This is intrinsically worthy of special notice. The Ballarat saddlery evidently competes on equal terms with any other in the Exhibition.

At the extreme end of this avenue, where we have now arrived, articles from the country districts and from Melbourne are pretty well jumbled together. The former furnish some fine samples of home-grown silk, and of a product to which we are more accustomed, viz., washed wool; while the metropolis is strong in soaps, glues, manufactured tobacco, and saddlery. As indicating what may yet be done in this direction, a few leaves of tobacco grown at Belvoir from seed of the Havannah plant are interesting. Among the more ornamental saddlery is a side-saddle made by Mr. J. Martin, of Melbourne, profuse in workmanship. Cases containing tobaccoes and cigars, exhibited by Messrs. Moss, White and Co., Tobelman, Hommel and Co., and Politz and Co., are ranged along the corner counters, while upon the face of the southern wall above is a fine show of colonial-grown "weed." Handsome exhibits of spirits, cordials, and liqueurs, from the establishment of Messrs. F. and J. Hemmons, make evident the fact that the time is arriving when we shall be independent of imports to a great extent in this as well as in other directions.

Turning round now, to proceed down the second avenue, we come upon cases of saddlery, some the property of Messrs. M'Farlane and Sons, and others of Messrs. T. Loader and Co. They do not enter into competition the one with the other—the former being of the elaborate and costly description, which appeals to the wealthy connoisseur, and the latter plain and substantial, and appealing directly to the mind commercial. Hames for cart harness, portions of head gear and girths, are among the articles which Messrs. Loader and Co. manufacture for wholesale consumption, as well as whipthongs, halters, curled horse-hair, and similar fixings. Passing down this avenue towards the end at which we entered, we have on our right hand the outer sides of the counters on which the provincials display their contributions, and on our left principally the results of Melbourne enterprise. Casting our eyes on the latter first, we see a case containing some dainty little feminine boots and slippers bearing the name of Emile Lance, and a large assortment of millinery, neckerchiefs, cap-fronts, stays, and the like, by various other exhibitors. On the right hand we have the contrast of quartz from Castlemaine, tobacco pipes of fine clay, candles, and beeswax from Dunolly, a slate mantelpiece from Ballarat, slabs of lightwood and biscuit from Wangaratta, and gems and quartz crystals from Beechworth—photographs of course everywhere, each borough having furnished, in accordance with the

suggestion of Mr. J. G. Knight (the secretary to the Commission), a municipal frame of them, some of them, it must be admitted, admirably taken and tastefully mounted. In this avenue, too, the banners of the various boroughs are conspicuous, and deserve looking at, the designs of some being very creditable. They certainly compare favourably with the bunting of the sister colonies which adorns the other side of the hall. A short way down this avenue, on the left-hand side, just before coming once more upon the cases of the Mining Department, is a very elegant exhibit which none ought to miss seeing. It is the contribution of Messrs. Joseph and Co., of Sandhurst, and consists of a working model in silver of a quartz crushing machine. It is diminutive, but strikingly accurate and illustrative, the little stampers pounding away with all the energy characteristic of the real machinery. The motive power is supplied by a small galvanic battery fixed beside the model. Glancing at the very elegantly-arranged photographic views furnished by the Essendon and Flemington Council, we recross the gangway leading to the annexe, and catch sight of some fine specimens of quartz supplied from Tarnagulla, and of the regulus of antimony from the Victoria Antimony Smelting Company's works. There are also pieces of antimony ore from the Costerfield Gold Mining Company, and from the Leviathan claim, Redcastle. The white oxide of this mineral is used in the manufacture of white paint, and the red sulphate in the manufacture of red paint. The Victorian lignite and splint coal exhibited here should not escape attention, nor the small objects of smelted iron, the product of the black sand found in various parts of these colonies, and notably in New Zealand. But, in inspecting the one side of this avenue, we must not overlook the other, which, besides the articles of female attire to which we have referred, is devoted to cases containing Victorian-made hats, of every variety, from the factories of Messrs. Ford Brothers, Mr. Fletcher, Mr. Wallworth, and Mr. Galvin. The contributions of the latter maker are very varied, comprising, besides the ordinary style, cocked hats, jockeys' caps, hunting and travelling caps of different shapes and descriptions of materials. A blackwood wardrobe, by Messrs. Ashmere and Sons, Geelong, is a creditable piece of work, and some chair frames challenge a word on the ground of their being strengthened with corner fastenings of a novel kind, patented by Mr. Hird. In fancy boxes for *bon-bons* and the like there is a good show, the work principally, we understand, of feminine hands. The Postal Department contributes the electro-type dies from which the postage stamps are struck off, together with a prettily-designed illustration of the stamps themselves. The exhibits in straw plaits for hats, bonnets, and the like, are all from the establishment of Mrs. Mealy, of Collingwood, who for many years has devoted herself to this industry, and now employs a large number of hands. The case is well arranged to show the various processes of straw splitting and plaiting, and the articles made up manifest not a little ingenuity and skill. The connoisseurs of the new roller skate will look with some interest at a patent roller chair, exhibited by the inventor, Mr. Burmeister, which has a steering apparatus attached to it on the regular race-boat tiller principle. By its means the direction of the chair can be influenced as desired either by the propellor or propellee. The collection of books exhibited by Mr. Detmold, the bookbinder, deserves prolonged scrutiny. The mounting of all of them is unexceptionable, but one of them—a Shakspeare, with illus-

trative milling—is fit to compete with specimens of ornamental binding in any part of the world. In feathers there are exhibits of all colours and sorts, from the establishment of Mr. J. Robertson, dyer, and Mrs. Reed; and in furs, Mr. J. R. Green shows several varieties, some of them made up into those comforts for winter travellers, footmuffs. One of Mr. Green's productions is of a somewhat *outré* kind—to wit, a kangaroo tail of respectable dimensions turned into a *horn* of plenty. Passing cases of embossed work, gold and silver lace, dyes, straw hats made up from imported plaits, barber-work and the like, we arrive at the end of the avenue, and in front of a blackwood bookcase, the production of Mr. J. G. Taylor, of Ballarat. This is a handsome piece of furniture, and exhibits some bold wood carving of tasteful and appropriate design. Some interesting stereotype work and printing materials and tools are to be seen on the counter running at right angles to the avenues, exhibited by Mr. Oliver Levey, Messrs. Walker, May and Co., Messrs. Clarson and Co., and Mr. F. B. Franklyn.

Turning now at the entrance to the Hall, we find the remarkable fur trophy, which does such infinite credit to the taste and enterprise of Mr. F. Gardner, the furrier, of Collins-street. It is composed of Huon pine somewhat in the shape of a triumphal arch, but so completely covered with furs, chiefly kangaroo, on its outer side as almost to hide the material of which it is constructed. Surmounting it are well-stuffed specimens of the kangaroo, emu, and Australian eagle, representing the Australian arms, while a wide-awake-looking dingo keeps guard at the entrance. Within the structure are cases containing rugs made up of the most costly furs, including one composed of skins of the black and white opossum, one of the rarest of Australian marsupials. The fur of the kangaroo, the wallaby, flying squirrel, native cat, and ordinary opossum is made up into articles infinite in their variety; while the down of the black swan—a down which is as white as snow—constitutes the material for muffs and boas in great force. A table in the centre of the trophy is covered with a *cloth* chiefly composed of the skins of native birds, the bright plumages of which give great effect to the curious composition. Stuffed birds are also perched upon stands made up of different-sized kangaroo claws; and stuffed animals adorn the floor of the compartment. Through the arch opposite to the one by which we entered the fur trophy, we come on one of the Commissioners' cases of wools, and round this, upon two of the dead llamas of the Acclimatisation Society, set up to look as like life as possible. Opposite to these, and balancing them, as it were, in the arrangement of the room, is a case the property of the same association, containing Angora goats, in the acclimatisation of which the society bids fair to be successful, there being already one hundred and forty in the colony. A box holding a couple of stuffed flying squirrels, one of the strangest of Australia's animal products, will be noticed between these two cases.

Leaving a handsome stand of liqueurs, bitters, essences, sauces, &c., exhibited by Mr. Alfred Felton, we proceed down the third avenue. A prominent object at our first step is a case of account-books from the establishment of Messrs. Sands and M'Dougall, comprising ledgers, day-books, journals, invoice-books, and all the multifarious works required for the literature of the counting-house or bank. They are bound in white vellum and Russia leather, some of them being mounted in brass, giving token of a strength calculated to far outlast those who write in

them. Clearly-engraved bank-notes and cheques make up a part of the exhibit. Mr. Detmold has also a number of account-books strongly bound. Messrs. Blundell and Ford contribute a case filled with many descriptions of printing, including specimen pages of the publications issuing from their premises. Among them *Melbourne Punch*, in a fancy dress of white satin in place of the ordinary homely paper, is not the least conspicuous. Along our left hand (a row of elegant but substantial garden seats excepted), we have for the most part the opposite side of the exhibits to which attention has already been devoted. On our right we notice first a billiard table, most ornamentally composed of several Australian woods, by Messrs. Paser Brothers, the legs and angles adorned with some well-executed grotesque carving. Biscuits are not objects easy of tasteful display, and Messrs. Swallow and Ariell must be congratulated on having dealt most happily with their manufacture. They have arranged them in pyramidal form, the basement composed of biscuits in boxes, the upper portion of biscuits decoratively grouped under glass, and the apex of a wheatsheaf. Each compartment bears the name of its contents, and the cognomen of the firm is worked out on one side by means of the gustative material they manufacture. Next to this biscuit trophy comes the handsome central gold case. Some fine nuggets are deposited in it, but the show of gold altogether is not one of the strong points of the Exhibition. This case helps to fill up the void made by the removal of the gilded pyramid representing the quantity of the precious metal abstracted from Victorian earth since the opening of the goldfields. The pyramid, after occupying this situation for about three weeks, was taken down, and sent off to enlighten the Parisians. It represents 36,514,361 ozs. of gold, amounting in value to £146,057,444. In consequence of the great height of this structure—over sixty-two feet—it somewhat dwarfed the apparent spaciousness of the hall, and its removal, therefore, is not altogether a disadvantage.

Another of the admirable billiard tables shown by Mr. Alcock stands next to the gold case, and upon it is placed a small case containing the Rev. Dr. Bleasdale's valuable collection of gems. This comprises precious stones from all parts of the colony; and beside many of these, the collector has placed foreign gems of like kind for purposes of comparison. Some of the stones are shown in the rough, others after having passed under the hands of Mr. Spink, the lapidary. One of the finest specimens is a green sapphire unearthed in the neighbourhood of Donnelly's Creek—an extremely rare and valuable gem. Diamonds, emeralds, rubies, topazes, opals, hyacinths, garnets, amethysts, and beryls are to be found in this collection, which is one which persons engaged in mining pursuits will do well to study. Many a rough but estimable gem has doubtless often been flung away by the digger, which an acquaintance with such a collection as this would have taught him to preserve. To the left of the billiard table on which Dr. Bleasdale's exhibits are displayed, Messrs. W. Clarke and Sons have a case containing ores of gold, silver, lead, and copper, of Victorian origin, amongst which are some rich pieces. Leaving gold and gems, we come upon a more prosaic article, namely, clothes, of which Messrs. Sargood, King and Sargood show a capital case of home-made, comprehending every article of dress, from fine woollen singlets to lusty overcoats. A step or two further brings us to one of the most noticeable objects in the room—the piano trophy of Messrs. Wilkie,

Kilner and Co. Pianos of almost all sorts, from the hundred-guinea cottage grand to the plain twenty-guinea article, are here to be seen, made up almost entirely of colonial materials. Some of the richest are of blackwood, and a finer wood for the purpose could not be obtained. The care with which these instruments are finished can hardly be understood without an inspection of their interiors, which are models of neatness and strength. By the side of this piano trophy are to be found—generally in full operation under nimble fingers—quite a different sort of instrument, the sewing machine, less musical but more productive. The latest improvements in these are well represented in the manufactures of Messrs. Grover and Baker, who also exhibit some magnificent embroidery which has been accomplished by these flying needles. Further on we have elegant cases of the dainty garments worn by ladies, to say nothing of babies; the exhibitors being Messrs. L. Robinson and Co., Mrs. Hill, and others, of Melbourne, and Messrs. Bright and Hitchcock, of Geelong. Messrs. Kilmister and Purdie, of Ballarat, show a case of saddlery, uniting the substantial and the elegant in a marked degree. The gallery pillar intersecting this avenue, like its fellow on the opposite side, has been surrounded from top to bottom with small shelves, supporting unnumbered bottles of colonial wines; the vintage of the Murray and the Yarra, of the Campaspe and the Barwon, all find representatives. Close at hand, Mr. S. Henderson, crinoline manufacturer, displays the flimsy articles of his trade in their happily-diminished proportions. An exquisite little model of a saddle, under a glass shade, emanates from the establishment of Mr. G. E. A. Kenney, and is a perfect wonder of dainty device. A case of clothing from the factory of Messrs. S. Solcberg and Sons stands next to the handsome glass edifice which envelopes Madame Decourtet's wax figure of the Empress Eugenie, in all the pride of imperial purple. *L'Imperatrice* stands a little too much under the shade of the organ gallery to be seen to the best advantage, but we believe she was designedly stationed there to prevent her wax majesty from being inconvenienced by the summer heat. On our left hand, an assortment of Victorian-made portmanteaus demands attention. They are the work of Messrs. Pausacker and Evans, who employ little besides colonial material upon their manufacture, and turn them out of all descriptions, from the compact little valise to the many-compartmented travelling trunk. Another object of attraction to the ladies meets us here, in the shape of two dummies (not agricultural ones), gay in all the frippery of fashionable feminine attire. Mr. Kruse, the chemist, exhibits a large collection of his wares, including fluid magnesia, sugar-coated pills, table vinegar, pomade, &c. Turning to the right, we come upon a display of boots of the tough order, grim with nails, and built, one would suppose, for everlasting wear. The architects of these leathern structures are for the most part apprentices connected with the Collingwood boot factory. A few steps more, and we find ourselves in a paradise of wines and cordials, jellies and jams, with a few bottles of Messrs. Rowlands and Lewis's sodawater superadded for the benefit of persons suffering a recovery from the effects of these dainties. In no manufactures is the Exhibition more noticeable than in those of wines and spirits, jams, jellies, bottled fruits, and other country products; and the mounting—which is all about them of which the casual visitor is permitted to have the opportunity of judging—in many instances is of a kind to compare favourably with the "get up" of the imported article.

Occupying a nook almost to themselves in the neighbourhood of the corner allotment we are now examining, is a collection of soaps much of it deserving to rank as "high art," so elaborate is the manipulation it has undergone.

> The art of our necessities is strange
> That can make vile things precious;

and though soap in its unadorned state may be far removed from a vile thing, it of a surety is made to look more precious than is its wont under the decorative skill of the hands which have turned it into apples and pears, peaches and nectarines, oranges and lemons—to say nothing of cameo-like medallions and marble bas—or may we say bar—relief. Messrs. Kitchen and Sons and Messrs. Tilley and Clack make great displays of these wonders; while for plainer soaps and candles the proprietors of the Hobson's Bay works hold a conspicuous place. Mr. William Carter, of Emerald Hill, who claims to have been the inventor of crochet, exhibits a multitude of articles connected with that once, fashionable work, and also some embroidered linen in various stages of advancement. Among the numerous necessities of civilised life, which are now seen to be supplied in this colony, it will be noticed that the manufacture of ink has not been forgotten; inks of the three standard colours, black, blue, and red, being exhibited by Mr. James Mallett, the goods finding their place at the foot of one of the flights of stairs leading up into the gallery, where the organ has been constructed, and the band, when one is present, takes up its quarters.

The view of the great Hall, obtainable from the front of this gallery, is perhaps the most striking which can be secured, and no visitor should miss seeing it. The organ, built against the wall in the rear, was made by Mr. Fincham, the whole being the product of local industry, and the result a decided success. As yet only the "swell" organ has been finished, but when completed it will be the largest instrument in the colony. It has a fine tone, and is capable under a master-hand of producing magnificent effects.

Descending the stairs and passing to the extreme corner at the foot of the avenue, which includes the courts of the other colonies, we shall light upon the grand cocoa display made by Messrs. C. Bates and Co., who have evinced great skill in disposing their goods so as to afford the curious the clearest insight into the process of cocoa manufacture. They show first the cocoa nuts in their raw state, and also engravings representing the pod from which these nuts are taken. Next comes the roasted nut, then the nibs, and then the various preparations into which the produce of the cocoa tree is transformed. Among the objects represented in manufactured cocoa, the visitor will notice good-sized busts of Victor Emmanuel and Garibaldi. Proceeding now up the avenue, we walk for the first few yards in a grove of leather—leather of all colours and of different degrees of thickness and finish. The whole is of colonial make, but the process of manufacture is illustrated by a series of fine photographs of the interior of well-known works at Bermondsey, England. Samples of oil-skin clothing, Victorian made, also find a place in this locality.

The New Zealand Court, which presents itself next in our ramble, contains a vast number of interesting articles, most of them of a substantial and downright useful character. Thus there are flour and grain, flax, wool, coal, building stone, woods, barks, and the like. Among the more

attractive exhibits the visitor should inspect a table—a fine piece of workmanship—composed of 17,000 pieces. The samples of wood devoted to this purpose are well selected, and the design and execution are alike excellent. A figure cut in Oamaru stone is a singularly clean bit of carving. The peculiarity of the material in which this is cut is, that it is soft when first taken from the quarry, and hardens rapidly when exposed to the air. It is likely to prove invaluable for building purposes. The collection of flax fibres is a good one, the coloured fibres being especially attractive. Silk is also exhibited in close contrast with the better known New Zealand products. A nest of Maori kits, made from flax, adorns the front of the court, where also hangs a curiosity in its way—viz., a knife made from the Taranaki steel sand. Samples of the titaniferous iron sand find a place in the collection. Some splendid Kauri gum should not escape notice; a group of Otago bush sticks is sure from its prominent position to catch the eye of the visitor. An object, however, which is less likely to receive the attention it deserves is a book of fern impressions very carefully executed and well worthy of a few minutes' inspection. The greater part of the New Zealand exhibits are from Southland, the Dunedin district being very poorly represented.

The Tasmanian Court, which comes next, is one of the best-arranged and most comprehensive in the entire building. All the articles seem to be of good quality, and great trouble has been taken by the Commissioners representing the island colony so to dispose and decorate them as to set them off to the utmost advantage. A striking feature on entering the court is the show of grain and pulse, arranged under glass and placed obliquely against the wall. Some stems of oats of gigantic stature are also shown, being culled from a crop grown at Bishopbourne in 1864, the average height of which is stated to have been seven feet; those exhibited are much taller. Below the grain cases are a couple of pair of sculls, made, the one pair from Gordon River pine, and the other from gum. The paintings and photographs disposed against the wall above the grain are some of them admirably executed. The principal painting in the court, however, is hung in front of the pillar, and is too peculiar a composition not to catch the eye of the visitor at once. The subject is a sacred one, and it is sufficient to say that it is from the studio of Dowling to give assurance of its possessing great merit.* Among the finest and most artistic things in the Exhibition must rank the needlework shown here. The group of flowers and blossoming stems worked in worsted by Mrs. Burgess is far superior to the general run of articles of this description. Passing, however, to more prosaic objects, the wood of course demands attention. We have referred in another page to the large slab of blackwood, measuring twelve feet by three, which adorns the front of the Court, but the timber trophy is equally attractive, while beautiful specimens of native wood are scattered around. Besides the two staples—blackwood and Huon pine, which, as shown in the Victorian furniture court, can be so felicitously worked together—there are samples of bluegum, scented wood, muskwood, cherry-tree, sheoak, heoak, silver wattle, sassafras, stringybark, peppermint, myrtle, pinkwood, and a variety of others. A fine article, showing off many woods to advantage, its manu-

* Since the above was in type, this painting has been removed into the Picture Gallery.

facturer among the rest, is a writing-desk made by Mr. J. Wood, of Launceston, composed of no less than 1470 pieces. Oils distilled from the leaves of blue and white gum, peppermint, and sassafras, form part of the exhibits. We cannot stop to specify all the jams, jellies, and meat preparations, but their name is legion. Hops are in full force, and dried fruits, and biscuits. One interesting contribution is a *hortus siccus* of flowers gathered by Mr. John Abbott in mid-winter—viz., July last—dried and arranged in a large album. The modelled fruit has been well chosen, and executed with care; and it affords evidence of how greatly favoured of Pomona is the Tasmanian soil. The building stones of Tasmania have long been popular, the excellent Kangaroo Point freestone forming the front elevation of many a beautiful Melbourne building. Under the counter are exhibited samples of all sorts, together with fire bricks, and the clay of which they are composed. One article, standing in a prominent position in the court towards the centre of the Hall, affords an instance of the tasteful results which may be produced from the simplest materials. It is a pine table, upon which real ferns and other leaves have been pressed and then super-varnished. The grouping of the plants has been judiciously managed, and the effect altogether is excellent. Near this table the visitor must not neglect to cast an eye on Mrs. Meredith's delightful series of water-colours; and if time be not wanting, Mr. Morton Allport's stereoscopic photographs will give those who have not visited the island some notion of the exquisiteness of the scenery it boasts. The specimens of book-binding exhibited by Messrs. Walch and Sons serve to show that Victoria is not singular in the high position which this trade has attained. A handsome case of topazes from Flinders Island is shown by Mr. Crouch, of Hobart Town. A less showy but more useful mineral is the titaniferous iron sand, of which a quantity from North-West Bay is exhibited. Professor Miller, of King's College, London, has analysed this substance, and finds it to consist of—"Peroxide, with a little magnetic oxide of iron, 42·70; titanic acid, 44·30; silica, 3·60; magnesia, 2·10; water, 0·52; alumina and oxide of chromium, 6·78; lime, with oxides of cobalt, copper, manganese, and phosphoric acid, mere traces." Contributions from the coal mines of Tasmania are not wanting; among the rest is the anthracite coal found in the neighbourhood of Hobart Town.

Western Australia occupies less room in the Exhibition than Tasmania, but has almost equal cause for gratulation at the taste displayed in the arrangement of the articles exhibited. Prominent among these are the woods of the colony, two of which—the mahogany and the sandal—are well known to commerce. A slab of the former wood, polished, is shown by Mr. H. Saw, of Perth, measuring six feet by two and three-quarters. Specimens of red and white gum, tuart, casuarina, and raspberry-jam woods are plentiful. The last-mentioned gains its name from the odour it gives forth, which resembles that of raspberry jam. Some large blocks, in the rough, of the woods of Western Australia, as well as of Tasmania, are to be found in the wing of the annexe, and in the garden beyond. The following instructive account of the Western Australian timber we copy from the introduction to the catalogue issued by the Commissioners for the colony in Melbourne:—

The principal timber trees of this colony are of the Eucalyptus or Myrtle family. Amongst the most generally useful of these is that commonly called mahogany, and by the natives jarrah. Of this wood it was stated

some years ago by Admiral Sir James Stirling, before a Committee of the House of Commons, that there is sufficient to build twenty British navies. None of the neighbouring colonies possess timber of similar character to the jarrah, or endowed with equally valuable properties. If cut at the proper season, *when the sap is down* (a precaution too little attended to), it will be found to be the most enduring of all woods. On this condition it defies decay—time, weather, water, the white ant, and the sea-worm have no effect upon it. Specimens will be found in the Exhibition of portions of wood which have been nearly thirty years partly under water and partly out. Others have been used as posts, and for the same period buried in the sand, where the white ant destroys in a few weeks every other kind of wood. For this peculiar property the jarrah is now much sought after for railway sleepers and telegraph posts in India and the colonies. It is admirably adapted for dock-gates, piles, and other purposes, and for keel-pieces, kelsons, and other heavy timber in shipbuilding. The chief objection raised against it is that it is liable to "shakes," the trees being very commonly unsound at heart. In this colony vessels of considerable burthen are built entirely of this wood, the peculiar properties of which render copper sheathing unnecessary, although the sea-worm is most abundant in these waters. Another most valuable kind of timber is a variety of white gum, called the *Tooart*—close-grained, not to be split, very hard, and capable of enduring a great amount of heat without rending. It is used for keels, capstans, windlasses, naves of wheels, &c., also in the engine rooms of steam-vessels, liable to exposure to great heat. Both tooart and jarrah were used to a small extent in the construction of H.M.S. "Hannibal," and the former wood especially met with high encomiums from the Admiralty surveyors. The *Bluegum*, which grows in immense forests, and attains a vast height and size, to the southward of Cape Leuwin, is allied to the tooart, and quite distinct from the Tasmanian one. A splendid field for capital will be found in these magnificent timber forests, and every inducement is offered by the local Government for its introduction. The license-fees are merely nominal, labour is cheap and abundant (although of a rough kind), and the chief difficulty at present experienced is the high price of freight. The *Sandalwood* of Western Australia has long proved a most valuable export, in large quantities, to Singapore and China. The *Raspberry-jam*, a species of acacia, has an agreeable scent, and is well adapted for cabinet purposes. The *Casuarina*, or Sheoak, is remarkable for its numerous large bars of radial fibre, which render it difficult to be split in the direction of its circumference, and it shrinks the least of any wood in the direction of its radius. The *Sheoak* is used not only for shingles, but for axe-handles, spokes and felloes, &c.; the *Morrell* for shafts, &c. Both the White and Blue Gums are so hard as to be used for tramways. The following observations on the *Jarrah*, or Mahogany, are by James Manning, Esq., C.E.:—"'Jarrah, or Djaryl,' is the 'Eucalyptus Marginata,' commonly called mahogany, from its similarity to the wood from Honduras and the West Indies. It is applicable for every purpose for which ornamental wood can be required, some of it being of the very finest grain and showing much figure, mottled, curls, feathers, and excrescences, a feature peculiar to colonial wood, and highly effective in point of ornament, as will be seen from the specimens forwarded. While it is highly adapted for ornamental purposes, it is no less valuable as a timber for heavy work, where strength, durability, and the property of resisting the attacks of the 'white ant' and 'Teredo navalis' are necessary. Thus for timbers of all kinds for houses, warehouses, wharves, jetties, bridges, &c., it is invaluable. For piles it should be used whole (not cut into quarters), either round or hewn; the former is preferable, there being very little sap, and the outside portion of the heartwood is stronger by far than the inner portions, near the centre; hence the desirability of keeping the annular rings complete. The timber of this colony is moreover subject to the peculiarity of being defective at heart, and although the sound timber does resist the teredo and white ant, the heart and defective portions do not. Hence the importance of keeping the outer annular rings intact, for neither of these insects will touch the sound wood."

In minerals, as well as in timbers, Western Australia proves the extent of her resources by the contributions which form part of this collection.

Copper ores, of varying degrees of richness, are supplied in abundance, most of them coming from the district of country of which Champion Bay forms the outlet. Iron ore is also represented, as well as lead, coal, antimony, and plumbago. But very slight traces of gold have as yet been discovered in Western Australia. Pipeclays are to be found among the exhibits, as well as honestones and ochres. In manufactured goods, besides turned woods of various kinds, the principal article shown is leather, of which there is a quantity from the tannery of Mr. Ranford, of Perth. Of wines there are not many samples, as, though the vine grows luxuriantly in the colony, little more of its juice is expressed than is sufficient to satisfy the local consumption. The bulk of that produced is of a richer, fruitier description than is common in the southern and eastern colonies. Raisin-making seems to be a facile operation in this colony, and two splendid samples find a place in the court. Grain, flour, silk, ambergris, wool, and sponges, are also exhibited; and among cases of curiosities will be noticed a good conchological collection made by Mr. A. Shenton, of Perth.

The show in the South Australian Court is somewhat disappointing, perhaps more from the fact of too great expectations having been formed, in consequence of the promptitude and heartiness with which the invitation of the Melbourne Commissioners was accepted, than from any shortcoming in the collection. One marked omission there is, however—one of the staples of the colony, viz., wool, being unrepresented. Of copper ore and wines, on the contrary, there is no lack, the samples of the latter numbering no less than 610 in all. The visitor to this court must not forget that the bulk of these are placed in the cellars along with other exhibits of their class, while the larger articles of manufacture, such as agricultural implements, in which the colony puts in a conspicuous appearance, are deposited in the wing of the annexe, where, indeed, will be found much of what may be termed the overflow of the courts of the sister colonies. The richness of the copper ore exhibited need scarcely be remarked, as it is well known that in no part of the world are finer specimens of this mineral obtained. There are contributions from the Burra Burra, Moonta, and Wallaroo Mines. Samples of silver-lead ore are also to be observed, as well as an ore containing gold, silver, and nickel, associated with iron pyrites. Among the stimulative beverages it will be seen that liqueurs, and even brandies, are not wanting. The cases of silver work occupy a prominent position in this court, and attract much attention. The articles contained in them are the work of Mr. Steiner and Mr. Wendt, of Adelaide, and their beauty and chasteness certainly deserve all the praise they have received. A vase and cross, hammered out of blocks of copper, and a lot of miniature jugs, cups, &c., made out of silver coins, are the work of Mr. Nitschke, the inventor of the copper still set up in the annexe, which has shown itself to be so excellently adapted for the work for which it is designed. A trophy of timber, banked up with barrels of flour, is erected in front of the court, but it is dwarfed by comparison with the magnificent pile constructed by the Tasmanians. The case of fruit models, however, can hold its own against any in the Exhibition.

A small portion of the counter space set apart for the use of the South Australians has been devoted to Batavia, which contributes a limited collection of products intrinsically valuable but not showy. They consist

principally of coffee, tobacco, spices, tea, silk, sugar, rice, oil, and hemp, and are to be found—partially boarded off from the South Australian exhibits—close to the entrance to the Octagon. We extract the following interesting particulars concerning these exhibits, and the Dutch colonies which send them, from *The Australasian* of December 8th:—

The article of which most specimens are sent is rice. The Java ricefields not only feed from seven to eight millions of indigenous inhabitants, but supply Holland, Belgium, France, and Germany. The specimens here exhibited are choice and fine, but we shall not say much about them. In certain localities of Australia rice may be grown with a steady profit, but only in particular localities, and only by means of cheap labour. The process of culture is unmistakably unhealthy. It requires a strong heat operating upon shallow water covering a substratum of liquid mud. White men will have nothing to do with them, except as proprietors, and as coloured labour is barely obtainable, we may be sure that, except in a section of Riverina and in Carpentaria, rice will not be grown among us, and even there not for years to come. The indigo exhibited is very fine, with which notice we pass on. Two excellent specimens of silk attest the progress which the Batavians are making in sericulture. Both, the yellow and the white alike, have got that firmness of fibre upon which the value of silk depends, the insect being evidently of a healthy breed; and the silk well reeled. These specimens are worth fully 25s. per pound, the best specimens of Australian that we have seen not exceeding 14s. Next we come upon the spices, so dear to our associations as connected with the subject of Christmas plum-puddings. Here they all are—cloves, nutmegs, allspice, cinnamon—just as one sees them in the grocers' windows, but having still a spice of novelty about them, inasmuch as they are shown in their natural, uncommercial state, fresh from the tree. Tea and tobacco are here, as they may be seen anywhere. The other products are more peculiar. There is a very fine specimen of mother-of-pearl. The oils are represented in great force. There is a particularly fine display of gutta-percha, which Borneo especially produces in any possible quantities. Caoutchouc (indiarubber) is also present, and teak shows the ship-building material that Java possesses. Bamboos and ropes constructed from the cane, two good specimens of native lead, and some parcels of herbs, complete the list. More than half the commodities which could have been forwarded, and should have been forwarded, are wanting. The famous tin of Banca is nowhere. Not one of the gorgeous birds of paradise, children of the sun and of the Moluccas, is to be seen; and the trepang, which keeps up of itself a trade employing hundreds of vessels, is quite ignored.

We regret this, for however little in the future Australia may care for our outlying districts, the great East Indian Archipelago is certain to become to us every year more and more an object of vital interest. It lies dead in the track between us and Hindostan. It will have the complete command of our telegraph line. Moreover, our commerce with these great island-continents, Java, Sumatra, Borneo, is growing like a young bay tree. When the regions round the Gulf of Carpentaria are fairly settled, as in a quarter of a century they are certain to be, the North Australians will have fully as much to do with Banca, Celebes, Borneo, and Papua as with Sydney and Melbourne. Before going into dealings with these regions, it is just as well to know something about them. The intercourse with them will take place under very different circumstances from that with Polynesia. The Malayan races inhabiting the three greater islands form highly-organised communities, devout believers in Mahometanism, to the full as pugnacious as the New Zealanders, numbering their men by hundreds of thousands and millions, and accustomed to act together under hereditary princes. Over all and above all are the Dutch, the race who, under De Ruyter and Van Tromp, fought us so hard, and who, under provocation, would not be disinclined to fight us again. Considering the complex character of the region and the people, it is remarkable that we should know so little about them. Our commercial intercourse is already considerable, but excepting the roadstead of Batavia, we know considerably less of the East Indian Archipelago than our ancestors did 300 years ago. The principal cause is, of course, the policy of the Government. The Dutch seem to take after Prince Metternich, who once upon a time sent an Englishman out of

Vienna for having written a book in praise of Austria, informing him that the Government did not want to be either abused or praised, but to be let alone. In many points King William and his Ministers are liberal enough. They are thoroughly in earnest, for instance, in pushing on the telegraph. But in most respects the policy pursued is utterly antediluvian, and as opposed to English notions as darkness to light.

How the Dutch got hold of these glorious islands is a very simple story. In the olden times, when the Indian traders first established themselves, under the name of the merchant adventurers, who subsequently merged in that of the English East India Company, their ideas were entirely directed to these very same islands, but chiefly to the Moluccas for the spices. A good spice voyage then was for profit much like what a good slave voyage is to a Cuban planter—he could very well afford to lose every other vessel, and yet make cent. per cent. When England laid its strong hand upon the empire of the Moguls, it tossed over the islands with their lucrative trade to her old rivals, the Dutch, pretty much like throwing a bone to a dog, and the dog took the bone, and a very good bone it was. The system thenceforward pursued by the Hollanders was one so curiously opposed to our notions, not only present but past, that it is eminently noteworthy. It was a kind of Spanish policy. The colonial native was to work chiefly for the benefit of the mother country. He was to have enough means to keep him in tolerable health and spirits, but beyond that the surplus belonged to his master. With the exception of the short interregnum from 1810-1814, when Lord Minto conquered Java, and the sagacious Sir Stamford Raffles, the founder of Singapore, was his *locum tenens*, this system has continued, and the result has been that, on the average, Java alone contributes above a million and a quarter sterling to the home revenue.

Such a system would be impossible in any British colony; but in the Netherlands East Indies everything is possible, because the climate and soil are such that they are perpetually producing. No sight can be more striking than sailing through the Straits of Sunda. The trees—regular forest giants—covered with interminable creepers, decked with the most gorgeous forest flowers, festoon the very edge of the waters. The ground yields three or four crops every year. There literally is nothing that will not grow. Even under their harsh, arbitrary government, the natives cannot help being well off. After paying all their taxes, generally amounting to fifty per cent. upon the net produce; after defraying all their religious ceremonies, which cost no small sum; and providing for the rice and pillau, to have a sufficiency of which constitutes their idea of earthly felicity—there is still enough of raw export left to make Batavia one of the commercial emporiums of the world. The trade is, as might be imagined, very peculiar, and we Australians know little about it. The Dutch-Indian capital sends us sugar and rice, and little else. But the home trade—that is, to Amsterdam—is quite of a different kind. It consists to a considerable extent of what our American cousins call "notions." Sugar and rice are the staple. A great deal of tea is shipped, and a very large quantity of coffee. But the assorted cargoes of the Dutch ships are made up with articles which only these islands can produce. Banca, for instance, sends tin. Except Cornwall, no island produces tin in quantities like Banca, and the Banca tin is better than the Cornish. Celebes and Gilolo, and a part of Sumatra, remit the unrivalled nutmegs, cloves, and allspice, which go far to make up the chief merit of Christmas puddings all the world round. Borneo, Sumatra, Java, and New Guinea manage between them to remit a considerable quantity of stream gold. The Moluccas send birds of paradise plumes, of interest to old ladies and to young ones. A very large and steadily-increasing export of sulphur takes place from Sumatra and Borneo, which bids fair to undersell the Sicilian in the European markets. Borneo also remits the greater portion of the gutta-percha, and a great deal of the indiarubber, consumed in the world. From Batavia, likewise, is shipped, in neatly-packed cases, that precious trepang, or desiccated seaslug, which to Johnny Chinaman is more enthralling than opium itself. A Dutch East Indiaman, in a word, is like a Noah's Ark, containing a little of everything. When the next Exhibition comes round, wherever it may be held, we hope that these everythings will stand visibly forward. As it is, we must conclude as we began, regretting that the absent friends so greatly preponderate over the present.

Although but a few weeks have elapsed since the time when it was thought probable that the Intercolonial Exhibition would take place without the oldest colony being officially represented at it, the Sydney Commission, appointed at the eleventh hour, exerted themselves so earnestly that they were enabled to contribute at last one of the best collections in the building. The timber of the colony in all its variety is well represented, the greater part of the sub-counter space being devoted to the cleanly-planed and polished blocks contributed by all parts of the vast territory from Twofold Bay in the south to Clarence River in the north. One prodigious plank of cedar, emanating from the Richmond River district, but sawn and polished by Messrs. M'Kendrick and M'Ewan, of Melbourne, is exhibited against the wall at the end of the avenue up which we are now advancing. It is 12½ feet long by 4½ feet broad, and is stated to be the largest plank of cedar yet sawn. One of the most valuable products of New South Wales—its coal—is exhibited in various characters and phases, the biggest and most noticeable, however, being placed in a conspicuous position in the annexe. An exhibit occupying a merited place of honour in front of the court which we have reached, is a collection of tweeds, grown and manufactured in New South Wales, the manufacturer being Mr. O. E. Ebsworth, of Sydney. The excellence of this product of colonial enterprise and industry will be readily perceptible. Messrs. French and Sons also exhibit a couple of specimens of tweed cloth. Their manufactory has not yet grown to the importance of that of Mr. Ebsworth, who gives employment to seventy hands, and turns out articles which, as we see, will bear comparison with the finest English make. Another manufacture in which Sydney appears to considerably outstrip Melbourne is that of leather, a display of which is made by Messrs. Alderson and Sons, which includes enamelled leather, an article which by Melbourne consumers has hitherto been imported from the other side of the globe. An instance of the value of these competitive exhibitions is afforded by this exhibit, as since it has been displayed it is alleged that a portion of the Melbourne trade in this commodity has been diverted to the handier source of supply which has been thus disclosed. In some of the principal leathern products, and notably boots and saddlery, it will be observed that the elder colony manifests no deficiency. The elegance of one side-saddle could not well be surpassed. It is said to have been designed by the maker as a present to the Princess of Wales. In ironwork there are several exhibits, one of them being an article not likely to escape notice—to wit, a large casting of the Royal arms, emanating from the foundry of Messrs. Russell and Co. Building stone, bricks, stoneware, and rough glass-ware are among the contributions sent by our eastern neighbours. Kerosene and paraffin oils, crude and refined, are exhibited, as well as productions displaying taste and workmanship, such as polished tortoiseshell articles of various kinds, workings in silver, photographs, paintings. Among the last-mentioned is a water-colour sketch taken in the neighbourhood of Sydney Heads, well worthy of prolonged inspection. A good coloured likeness of Sir John Young is interesting, as representing a gentleman who occupied a prominent position in contemporary history, in connection with one of the most noteworthy acts of modern British statesmanship—the voluntary surrender of the Ionian Isles.

The show made by the Northern or Clarence River district of New South Wales is not the least remarkable feature of the Exhibition. All sorts of

products of the orchard and the garden seem to be here collected, among the rest a preserve which is somewhat of a novelty, viz., grape jelly. Coal, antimony, and iron pyrites, figure among its minerals; while in agricultural productions are to be found samples of its maize, ground and whole, an article much esteemed in mercantile circles. The zoology of the district is admirably illustrated in a most complete collection of birds, beasts, and fishes, skeletons and skulls, industriously gathered and forwarded for exhibition by Mr. J. F. Wilcox and Mr. J. M'Gillivray. No other part of Australia is in this respect so well represented.

The display in the Queensland Court, never very extensive, is now meagre in the extreme, as the greater portion of the articles contributed by the northern colony have been forwarded to the Paris Exhibition. The visitor will still find, however, a goodly number of samples of the varied timber growth of the colony, as well as of articles as yet less extensively known—viz., cotton and silk. Sugar made for exhibition, out of West Indian cane grown in Queensland, finds a place in the collection, and different descriptions of bottled fruits and pickles. In minerals, the principal specimens consist of copper ore, of considerable richness, from the Peak Downs Company's Mine in the far north. A few specimens of surface coal, gums, barks, wool, and dried meats, complete the collection.

The unused space reserved for intercolonial purposes in this part of the building, has been turned to good account for the disposal of Victorian exhibits for which no eligible site could be found. On our left hand, as we approach the end of our concluding avenue, we see ranged several handsome cases, containing mineral preparations, assays, and chemicals; while on our right hand, out towards the hall-entrance, are tasteful glass stands, containing goods of divers sorts, deserving of closer inspection. Among the former, the contribution of Messrs. Clark and Co., chemical and paint manufacturers, occupies a prominent position. This firm shows a quantity of antimony ore, and regulus of antimony, together with the white and red paints which are produced from it. In the case with the antimony will be remarked magnificent specimens of soda crystals, which are the product of the works of the same factors. An extensive assortment of assays and minerals is exhibited by Mr. Sidney Gibbons, the analytical chemist, who also shows a bottle of native petroleum in the state it exhibits when pumped from the earth, and a valuable series of microscopic illustrations. Home-manufactured spices, macaroni, vermicelli, coffee, and chicory, are ranged along the left-hand counter, where also another manufacturer of ink, Mr. F. G. Wormald, finds room to display the articles of his trade, which include, among other things, ink powder, which can be readily turned into ink when required for use. At the extreme end of this counter, beyond the exhibits of sundry chemists, will be found the case of elegantly-modelled fruit which the Victorian Commission employed Miss Thomas to produce. On our right hand, after inspecting the Queensland Court, are ranged central cases from various Victorian exhibitors. One of these is from Messrs. Tronson and Hill, and contains woollen flock or shoddy; another serves to display Messrs. Harper and Co.'s coffees; while a third most tasteful cedar and glass stand exhibits to advantage the various grains and meals in which Mr. George Bencraft deals. The corner between these and the New Caledonian exhibits is devoted to the enticing preparations of the confectioners. Several manufacturers contribute their wares, but those of Messrs. Leonard, Giraud and Co. attract most atten-

tion, from the taste with which they are arranged, and the delicacy and beauty of the gustative goods exhibited. Hard by, Mr. R. Laver exhibits curry powder, which he invites all connoisseurs to taste, and challenges the world to surpass. Hanging against a pillar, above the box of confectionery accepted as a present from the firm just mentioned, by Lady Manners-Sutton, is a sample case of a very different description of ware, useful enough, but less enticing—we allude to Mr. Borthwick's patent anti-fouling composition for coating the bottoms of iron ships, to prevent them becoming overgrown with weeds. We believe that this mixture has been found to answer the most sanguine expectations of the shipowners who have tried it.

Retracing our steps a few yards, we come upon the counter and wall space devoted to New Caledonia. This young French settlement has come out strong on the occasion, and makes a really excellent show. The island is well adapted to the growth of sugar, and several large-sized canes are exhibited, as well as samples of the sugar produced from them. In another year or two it is expected that many hundred tons of this valuable commodity will be turned out. Coffee, rice, tobacco, and maize, are among the products of the island, the samples of the last-named grain being noticeably luxuriant. Several native plants are exhibited, with the essential oils and perfumes extracted from them. The weapons of the aborigines of the island constitute an interesting item; and a large quantity of sea-island cotton, grown at Lejou—one of the Royalty Islands—is deserving of notice. Tortoiseshell, of very fair quality, is obtained in the neighbourhood of New Caledonia, and finds a place among its exhibits. But perhaps the most unique article of all is the trepang, or bêche-de-la-mer, which is piled up in a rough box, on a corner of the counter in the rear of the court. This *bon bouche* of Chinese epicures has not before, that we are aware of, been seen in Melbourne. It is found in large quantities on the northern coast of this continent; and we fancy our readers will be interested in the following account which the Rev. J. E. T. Woods gives of the way in which the explorer Flinders fell in with a party of trepang fishers in the Gulf of Carpentaria, upwards of sixty years ago:—

After leaving the narrow passage between Cape Wilberforce and Bromby's Islands, the "Investigator" steered along the coast to the south-west. Some high islands prevented a view very far a-head, and while endeavouring to peer among them to discover a passage, a sight met Flinders' telescope which rather astonished him. Crusoe's surprise at seeing the footstep in the sand was nothing to his. There, in the most lonely part of Carpentaria, where even natives had disappeared, and where the sight of an animal moving seemed almost supernatural—there, under a rock close by one of the islands, a Chinese boat full of men was perceived. Flinders knew from the signs he had met with that some Asiatics must have been upon the coast at no very remote period, but he no more dreamt of meeting them than of meeting a parish beadle; and, to say the truth, he would much rather not have met them. There were some ugly stories afloat as to the honesty of Chinese boats in much more civilised seas than the one he was upon. His ship was armed, it was true; but fighting was disagreeable under any circumstances, especially in a rotten ship; and even if the strangers were pirates, and did not attack them, it would require such an amount of attention to watch them that the survey would be ended. These were Flinders' feelings as the "Investigator" glided towards the place where the boat was lying, and a nearer view did not tranquillise him. As he rounded the point his anxiety was considerably increased. It was not one boat, but he now beheld six, lying snugly covered like hulks, and anchored at some distance from the shore. But for the report of the natives about their having firearms, he might have been off his guard; but he now set them down as

a set of piratical cruisers, who secreted themselves here from pursuit, and issued out as the season permitted or prey invited them.

Impressed with this idea, the "Investigator" tacked to work up for the road, and on the pennant and ensign being hoisted, each of the ships hung out a small white flag. Lieutenant Flinders was now sent in an armed whaleboat to learn who they were, while the ship came to an anchor with a spring on the cable and all hands at quarters. Every motion in the whaleboat and in the vessel alongside which she was lying was closely watched, but all seemed to pass quietly till the boat returned. Lieutenant Flinders informed his captain that they were prows from Macassar, and the six Malay commanders came on board shortly afterwards in a canoe. Fortunately the cook on board the "Investigator" was a Malay, and thus in a short time communications were established.

The chief of the prows was a short elderly man, named Pobasso. He said that there were sixty canoes upon the coast, in different divisions, and that Salloo was the commander-in-chief. These people (I now quote from Flinders) were Mahometans, and they expressed great horror, on looking into the launch, to see pigs there. Yet they had no objection to port wine, and even requested a bottle to take with them at sunset.

The object of their expedition was a certain marine animal, named trepang, bêche-de-la-mer, sea cucumber, or *Holuthurius cucumis*, which had been seen first by the explorer upon the coral reefs, and afterwards had been dragged up in great quantities by the *seine* net in Caledon Bay. The Malays get the trepang by diving for it in three to eight fathoms; and where it is abundant, a man will bring up eight or ten at a time. They then preserve them by splitting them and drying them in the sun, stretched on pieces of bamboo, after being boiled and pressed between stones. A thousand trepang make a picol, and 100 picols is a cargo for a prow. It is carried to Timor, and sold to the Chinese who meet them there; and when all the fleet is assembled, they return to Macassar. The *Holuthuria* belong to the family of *Echinodermata*, of which the sea-egg upon our coast is a familiar example. The body is free, naked, soft, and thick, with anything but an eatable appearance. What makes them still more repulsive and disgusting is that the skin wrinkles about like that of a leech, and is generally covered with papillary excrescences or warts of different colours. The head is surrounded with tentacles. They are indolent animals; but when handled, the body contracts, and the tentacles are immediately concealed. They usually lie exposed in the shallow waters, or buried in coral sand, their feathery tentacles being alone exposed. What they live upon is a mystery, as their intestines only contain pellets of coral rock, which is not very nourishing to an animal which does not secrete a shell.

Turning to the right, at the extremity of the avenue we have traversed, it will be seen that against the northern wall of the Hall, and upon and underneath the counter projecting from it, are to be found many Victorian exhibits of importance. Passing over the great plank of cedar already referred to, the native weapons contributed by the Central Board appointed to watch over the interests of the aborigines conspicuously attract attention. They include spears of all kinds, shields, boomerangs, waddies, stone hatchets, and throwing-sticks. A small box, containing in miniature every description of aboriginal weapon, and ornamented with drawings, is an object of interest. Specimens of papers made from Victorian fibre, a valuable collection of seeds of castor-oil and fodder plants, charcoals from several Victorian woods, and samples of the woods themselves, constitute a portion of the articles exhibited in this quarter. These somewhat uninviting objects are set off by a few stands of well-executed wax flowers, the work of Mrs. Staffe. Close to the entrance, to which we have now returned, is placed a case containing samples of sugar, rum, treacle, and ivory-black, the product of the Victoria Sugar Company's refinery at Sandridge.

An article lately brought into the Exhibition, and placed in the furniture court, is too important a one to be passed over *sub silentio*. It is a

sideboard, manufactured by Mr. Peter M'Lean, cabinetmaker, out of a fine piece of cedar, and decorated with bold carvings by Messrs. Terlecki and Pilichowski. These are mainly symbolical of the chief pursuits of the people of Victoria; but the indigenous animals and plants of the colony are also largely introduced. The work is said to have been in course of preparation for six years, and the value of the exhibit is estimated at £1200.

Before leaving the main hall, we ought to state that, thanks to the ingenuity and perseverance of Mr. Severn, of the Union Bank, the sunlights in the lofty roof are now lighted each evening by electricity, the apparatus for the purpose being situated in a little loft over the furniture court of Messrs. Beauchamp and Rocke. It should also be stated that Messrs. T. Ellis and Co., the photographers to the Commissioners, have taken some excellent pictures of the interior of the room, from various points of view, and are still pursuing their labours in other parts of the building.

THE MACHINE ROOM.

Leaving the Main Hall by the door through which we entered it, we find ourselves in the apartment principally devoted to the exhibition of machinery. In a corner on our right, but not otherwise tenanted, excepting by an umbrella stand, is a case, the contribution of the Bible Society, containing specimens of the Bible in no less than forty-six languages. Among the rest will be observed a copy of the sacred Scriptures in raised characters for the use of the blind, who are taught to read by drawing the extremities of their fingers over the page. Another interesting item of a somewhat similar kind faces the visitor as he emerges from the Hall. This is a stand containing pages of letterpress, and lithographs, illustrative of the progress of the art of printing in Victoria during the last ten years. Turning to the left now, and commencing a perambulation of the room, we come upon a working model of a double-action windlass, the value of which will readily explain itself. Messrs. Houghton and Co. have a stand adjoining for the manufacture and embossing of envelopes. Opposite to this stands one of the cleverest little machines in the room—viz., Messrs. Sands and M'Dougall's railway-ticket printing-press. This apparently semi-intelligent piece of machinery will print, number, and, if required, perforate, railway tickets faster than one could count them. The unprinted tickets are placed in a sort of open iron pillar on one side of the press, whence they are taken when the machine is set in motion, and with lightning speed transmitted up a similar pillar on the other side, their process of printing, &c., completed. Should the ticket become twisted, or the slightest derangement in the mechanism occur, the fact is signified to the workman by the ringing of a tell-tale bell. The press is altogether scarcely as large as an ordinary sewing-machine. Next to the stand of Messrs. Houghton and Co. is that of Messrs. Pearson and Co., where various operations in lithographic printing are being performed. Upon the central table are models of different kinds of engines, as well as other applications due to the dexterity of local inventors. A cooking-jack, to which hangs an object which purports to represent a piece of the ribs of beef, undertakes in one and the same operation to baste as well as turn the joint. To effect this, the dripping from the beef is conducted into a well in one corner of the

under dish. Into this well descends a series of little tin buckets, which on their ascent precipitate their contents into a short race, the mouth of which overhangs the joint. A series of garden knives, meat choppers, from the cutlery establishment of Mr. Grayson, affords evidence of the progress of Victorian manufactures in a somewhat unexpected direction. Coming next is the large threshing, riddling, and cleaning machine of Messrs. J. Robinson and Co., which is said to be a very perfect instrument. It, as well as the compound-stamp battery adjoining, is impelled by one of Dunn's rotary reversing engines, calculated, with a supply of water of $1\frac{3}{4}$ inches in diameter, to work up to four-horse power. Several other remarkably ingenious water-power engines are here shown. Messrs. Clarson, Massina and Co. exhibit a compact horizontal printing-press, engaged in turning off the sheets of the *Australian Journal*. Next come two knitting machines, one of them, by Messrs. Bowling and Dean, being devoted to stocking-making, and generally doing its work so well as to attract crowds round it. Upon the table space opposite these, and in fact in many places throughout the room, the visitor cannot fail to regard with wonder the numerous machines and manufactures contributed by the Victorian Railway Department, and collected by Mr. F. C. Christie, the locomotive superintendent. These are of all kinds, and are highly illustrative of the standard of excellence to which the works where they originate have been advanced.

It is some years since machines for turning irregular objects—such as shoe-lasts, wooden dolls, axe-handles, &c.—were invented in America, but there are few persons who have witnessed any of them in operation. A lathe of this kind, with certain improvements peculiar to itself, is exhibited here. It comes from the coach and railway-carriage factory of Mr. Williams, the present Mayor of Melbourne, and is kept pretty actively at work, turning off axe-handles of the orthodox American pattern. The slope in the handle and the square end to fit into the blade are all executed with astonishing rapidity as the piece of wood out of which the article is formed revolves. This difficult—apparently almost impossible—process is accomplished with the utmost ease, by means of a guide placed above the cutting tool. This guide presses against a model of the shape desired, which revolves like the wood which is being dealt with. The cutting tool follows the course of the guide, and the irregularities of shape of the model are reproduced in the article which is being carved. A complete axe-handle is thus produced out of a long block of timber in less than a minute. Adjoining this lathe is a nail-making machine, which has been so rarely attempted to be set in motion that we are precluded from saying anything about its *modus operandi*. A step further, and we come to the stand occupied by one of the cigar-making firm of Messrs. Moss, White and Co. The working tools of this manipulator of the fragrant weed are very simple, viz., ten active and skilful digits and a sharp knife. His materials are good Havanna tobacco and a little gum tragicum. A small table constitutes his workshop; and seated at this, he twists and cuts away at the leaves which Raleigh loved and James hated, producing with ease and rapidity cigars which, for excellence of workmanship and goodness of tobacco, may challenge comparison with any imported ones. This brings us to the end of the room, and, simply alluding to the fact of there being photographs, plans, and designs in the corner for the inspection of the curious, we will turn to the model of revolving shutters, erected by an enterprising Ballarat

firm, Messrs. Irving and Glover. These are made of wood, working with a steel spring, and certainly manifest a great improvement on the common clumsy method of guarding shop windows. Close to these shutters is a case of handsome brass foundry work of Mr. E. S. Danks; contiguous to which is the lathe and bench for comb-making, put up by Mr. Emmott. Pieces of bone and tortoiseshell are being continually turned into combs of all sizes and shapes by the dexterous workman here employed, the heating, cutting, and polishing processes being all performed with despatch. The glass house erected by Mr. William Evett, gold-beater, is on our left, with the old familiar gilded sign; and we have an opportunity of witnessing what can be achieved, by persistency and a mallet, with so ductile a metal as gold. Hard at work on an adjoining loom, constructed at the Williamstown Railway Works, is a workman manufacturing long and narrow bands of a fluffy material, used as lubricating pads for the axle-boxes of railway carriages. This loom was invented as well as constructed in the colony, and is said to be an unusually perfect weaving apparatus for the purpose for which it is designed. Several remarkable machines from the railway works follow, including a large screw-cutting lathe, a shaping machine for chairing castings, a hydraulic steam gauge testing machine of great power, a lever for bending metal bars into rings, and several other ingenious implements. A pretty model of what is termed a reciprocating water engine is exhibited by its inventor, Mr. J. E. Lowe. Its chief peculiarity, as compared with other water engines, is the rapidity of its action, as it is capable of being worked up to 300 revolutions per minute. It is engaged driving one of Messrs. Willcox and Gibbs's challenge sewing machines, which are affirmed to work faster and surer than any other description. Enclosures, in which engraving and printing operations are carried on by Mr. F. Price, Messrs. Pearson and Co., Mr. Calvert, and Messrs. Purton and Co., occupy the remainder of the space on our left hand, if we except a paper-ruling machine, which has not yet, we believe, been set in operation. On the counter to our right are multitudes of models of inventions, some of which seem feasible enough, but whose value can only be gauged by practice. Among the rest are engine-packing, spark-catchers, pumps, hooks, lifts, self-heating irons, steam engines, and a machine for drawing corks. With respect to the last-mentioned article, the visitor will readily conclude that if it should fail in performing the work for which it is designed it would not be for want of size or power.

Besides models and machinery, the room contains many photographs and drawings, and the upper portion of the walls all round is adorned with plaster copies of the Elgin marbles.

THE NORTHERN FOUNTAIN COURT,

Into which the central door of the Machine Room leads, contains two of Clayton and Shuttleworth's portable engines, one of which works the large fountain, or centrifugal pump, in the centre of the court, and the other turns the shaft which gives motion to most of the machines exhibited. The latter is of twenty and the former of sixteen horse power, but not worked up to so much as half its scope, the centrifugal pump only requiring for its working five or six horse power. The quantity of water thrown into the air by this imposing-looking object is equal to fifteen tons

per minute. The basin into which the water falls empties itself back into the pump, and thus a constant circulation of the fluid is secured.

Independent of the fountain, the chief attraction of this court consists of the building materials exhibited in it. There are arches of freestone from M'Cann's quarries; a sample of Castlemaine pavingstone, 12 feet 6 inches by 5 feet 6 inches in dimension; pillars of artificial stone; walls of brick; slabs of monumental marble; besides specimens of stoneware and other similar goods. A fossil tree, discovered in sinking a mining shaft, is a curiosity seldom witnessed; and adjoining it is a freak of rocky nature from Tasmania, which must have cost its owner some trouble before it arrived at its present location.

THE OCTAGON.

Entering this portion of the building by its northern doorway, and turning to the right, we pass between Marshall's case of cricketing materials and the exhibits of an enterprising pyrotechnist, and come upon some bronzed figures, turned out of hand in a creditable style by Mr. C. H. Mende. Some good specimens of marble mantelpieces are placed opposite to a singularly different description of work, viz., a knitted quilt, a snow-white comfortable-looking object, manufactured by Miss A. O'Donovan. The medallions by Mr. Scurry, and marble work by Mr. Veroli, display an excellence fully up to the average of imported articles of the kind; and after inspecting these we come upon an elegant case of fancy exhibits, contributed by Miss E. Woods. Bouquets of flowers made up from shells, bronzed and plain leatherwork, and other tasteful knicknacks, constitute the contents of this case. Not far from it is a pyramid of gold—external gold, that is—formed on the model of the great pyramid now on its way to Paris, typifying the amount of precious metal taken out of the claim of the United Extended Band of Hope Company, Ballarat, from the 25th of May, 1864, when the lead was struck, to the 21st of September, 1866; the pyramid represents 91,652 ounces. Beyond this is the perfumery case, exhibited by Messrs. Levy Bros., the Victorian agents for Rimmel's well-known manufacture. A great diversity of scents and toilet requisites here find a place, while in the centre a grotesque little fountain pours out a stream of odoriferous fluid for the benefit of all comers. Another of Messrs. Levy Brothers' exhibits close by is a handsome clock, on the top of which a brilliant-plumaged bird sings in a natural and life-like way. A still prettier object contributed by the same firm is an ornamental workbox, elaborately fitted up, and containing within a gilt box a yet smaller bird, which, on a spring being touched, leaps up, flutters its wings, and sings more excellently than the other one. These are among the few imported articles contained in the exhibition. The others shown by Messrs. Levy Brothers also find a place in the octagon. They consist of a large hall-clock, with magnificent bronze female figure, holding in her hand a patent rotary compensating pendulum; a musical-box, playing twelve tunes by means of barrel and reeds, drum, castanets, and bells; and a tableau mechanique, comprising a clock, orchestra, and dancing figures. Near this last-mentioned object is a collection of articles made by the prisoners at Pentridge. It includes carved work, mats, native weapons, clothes, &c. One piece of carving, represent-

ing a small figure, is the work of an incarcerated midshipman, who is said to have formed it with a common penknife out of the handle of a toothbrush. The visitor will next find himself among a perfect fleet of miniature yachts, brigs, frigates, steamers, and rowing boats, and among the rest will have an opportunity of inspecting a model of a floating battery designed for the defence of Hobson's Bay by Mr. Wilson, of the firm of Crouch and Wilson, architects. Two marble mantelpieces, exhibited by Messrs. Huxley, Parker and Co., are meritorious works; one especially, by far the less elaborate of the two, being designed and executed with unusual skill and taste. Models of buildings in shells and plaster, more models of ships, and the Berlin wool and leatherwork which pretty well pervade this portion of the Exhibition, are here interrupted by a large model illustrative of life on the goldfields, the handiwork of Gustavus Steinmeyer, of Kyneton. A case containing Burmeister's roller skates meets the eye here, as does a case containing Coppin's patent on the opposite side of the counter. Passing many curious articles, such as a copy of Luther's Bible, fossil shells from Schnapper Point, bouquets of seaweed, &c., we come to a very beautifully made pair of assaying scales, the credit of which belongs to Mr. H. Schreiber. Some figures and medallions by Miss Thomas, and cameos by Miss Kelly, show that artistic talent in Victoria is not confined to the male sex. A few vegetable ivory nuts are exhibited by Mr. W. Vazie Simons, carved in various grotesque shapes. The jewellery case shown by Mr. Crisp contains some elegant specimens; the emeu's egg has rarely been turned to such artistic account as in the lamp and inkstand Mr. Crisp exhibits. One of the noticeable objects, too, is a large colonial diamond found at Beechworth, and mounted in a ring. Two fine bronze figures, which, with the reduced copy of Kiss's "Amazon" and the colossal deer, form the collection brought from Europe by the Hon. W. Degraves, are stationed one on each side of the eastern entrance to the octagon. A pretty and novel object has been attached to one of these figures—namely, a bird cage, the bars of which are made of twisted glass. A glass fountain, by the maker of this last-mentioned article, is also to be seen. The spectacles exhibited by Mr. T. Gant, and the workings in turned metal by Mr. John Rettwig, being passed, we come to some of the finest specimens of wax flowers shown; they are the work of Mrs. Burgoyne. A well-finished lot of leather writing-cases is shown by Mr. Joseph Turner, and among numerous descriptions of fancy goods, the specimen of potichomanie, by Mrs. Lusher, and of needlework, by Mrs. Claridge, are sure to attract notice. In the midst of ornaments and bijouterie, it is curious to see two cases containing various kinds of surgical bandages and supports. The castings in bronze, iron, and zinc, shown by Mr. D. Livingstone, are far in advance of anything of the kind previously achieved in the colony, as are also the scagliola mantelpieces and pillars by Mr. T. A. Dunn. Among the colonial industries to be noticed, watch-cases made of Victorian gold and silver, water monkeys and jugs, miallwood pipes, stock-whip handles, &c., are shown in this apartment. The cases of jewellery and silverwork are full of interesting objects. Mr. W. Edwards shows epergnes of most tasteful workmanship; Messrs. Kilpatrick and Co. exhibit sets of jewellery rich with brilliants, as well as a large silver cup intended for a racing prize; and Messrs. Walsh Brothers have, besides other articles of value, two massive silver cups, the one for the Gippsland meeting, the other

offered by Messrs. J. Levy and Sons as a prize for the best growth of Silesian beet. A model of a kangaroo in silver, by Julius Hogarth, is a true work of art, as is also the leaf watch in Mr. J. Powell's gold case. Mr. H. Newman has a handsome case of gold chains, and Mr. Spink, the lapidary, shows a multitude of fine colonial gems. The spiral wood turning by Messrs. Roberts and Ford proves that the most difficult kind of work can be accomplished in this colony. An etching on charred wood by a miner named Leaf is possessed of some merit. It is in juxtaposition to a frame carved in wood by Kem Wah, the Chinese carver—a complicated piece of work, but far less so than the altar-piece which it has replaced. There are several dental exhibits, the best arranged being that of Mr. Charles Lange, who has managed to make the articles of his calling look attractive in spite of their teeth. The centre of the Octagon is occupied by a case filled with a bewildering posy of paper flowers, the work of Mrs. Staffe. The visitor before leaving this apartment should not forget to scrutinise the decorations of the dome, which, although painted on rough wood by the decorative artist, Mr. E. J. Bateman, are surpassingly clear and beautiful.

THE ANNEXE.

Straight across the Main Hall, and we come to the entrance to the Annexe, a corrugated iron structure added at the eleventh hour, when the proportions the Exhibition was likely to reach began to disclose themselves. The passage leading to this spacious erection is principally devoted to the Victorian grain and meal, samples of which are shown in tasteful cases of Huon pine and glass on each side of it. Near the Hall on the right hand is the Board of Agriculture's collection of analyses of soils, with the constituents of each written inside the bottles containing them. On the left-hand side are some large beet grown by Mr. Orlebar, 12½ acres of land having yielded 500 tons. In addition to the things already enumerated, the passage contains brushes, by Messrs. Stone and Zevenboom, cheeses, native weapons and drawings, and guano. Advancing to the Annexe, we come first to the coals of New South Wales and Tasmania, arranged so as to illustrate the seam where discovered; also, the shale of the former colony, and the product thereof, kerosene. The piece of cabinet work in which Messrs. Macmeikan and Co. have enshrined their bone manure stands close by, and is a curiosity well worth inspection. Adjoining this, Messrs. Gough and Co. show samples of their malt, white and black. The firm turn out some 700 bushels a-week, and are gradually getting the better of the imported article. Proceeding down the right centre we have carriages to the right of us, to the left of us, and in front of us, like the light brigade at Balaclava, with this difference, that our carriages have no guns on them. The whole are most creditable articles. They emanate from the factories of Messrs. Stevenson and Elliott, Mr. W. Williams, Messrs. Miller Bros., Messrs. M'Gregor and Agnew, Mr. H. Samwells, Mr. R. Miller, Mr. W. Crutch, Mr. J. Hackett, and Mr. F. Goernemann, of Melbourne; Mr. W. Carpenter, of Geelong; and Messrs. Cutter and Lever, of Ballarat. Street cabs are shown by Messrs. Maynard and Fisher, Mr. Hackett, and Mr. Andrew Elliott, of Melbourne, and Mr. W. Proctor, of Ballarat. Among the larger exhibits, a glance at which discloses the mode of their working, are the wine-presses, wool-presses, grape mills, &c., contributed by Mr. J. W.

Home, Messrs. T. Robinson and Co., and Messrs. Fulton and Shaw. Passing out into the wing of the Annexe, one of the first things to catch the eye is the copper still, made by Mr. Nitschke, of Adelaide, out of which spirit sixty degrees over proof has been readily obtained. It is said to be capable of distilling 600 gallons per twelve hours. Contiguous to the still, a self-heating bath, generally in operation, will be found to be a most useful invention. Without taking up more room than an ordinary bath, it contains a cistern of water and a furnace for making the water hot. The corner to the left has been termed Volunteer Corner, inasmuch as it contains all the materials for instructing a military neophyte—guns of all kinds; shot, whole and in segments; shells, canister, grape, together with photographs taken in English gunneries and arsenals. The large guns are placed outside in the enclosure, where the flower-show tents are erected, and where Messrs. Robinson and Co.'s mill is the most conspicuous object. Cartridges, fusees, and ammunition, Victorian made, form part of the collection to which we have just referred; and as there is generally an artilleryman present capable of imparting the fullest information, the inquiring visitor cannot do better than attend to his discourse. The heavy timber from the neighbouring colonies, agricultural implements, and things of that kind, are placed in this wing of the Annexe. With the machinery here, not far from the gun stand, is Mr. Enoch Chambers's patent stone-breaker.

Turning once more into the Annexe, and proceeding to the right hand to make the circuit of the building, we come to a sufficiency of manufactures to prove the advances the colony is rapidly making. In this way—Victorian made and generally Victorian material—we meet with Venetian blinds, sun blinds, machine-made doors and sashes, life-boats, coloured rock-work hangings, chaff cutters, earth closets, canvas buckets, hoses, and filters, japanned goods with colonial scenes illustrated on them, gas reflectors, manures, zinc and brass work, galvanised iron goods, axes—head as well as handle home-made—patent beehives, basketwork of the most elaborate description, ropes and rope cables, iron bedsteads, life belts, dressed flax, scoured wool, curled woodwork in infinite variety, cooking ranges of gigantic size and first-class finish, stoves for wine mulling, composing frames and printing presses, fire-proof safes, churns, oak wine-casks of 400 and 500 gallons, candle machines, silk flour-dressers, perambulators, race boats, lead piping and flooring, wire work, coach springs, cutlery, and agricultural implements of all sorts. A tour round this Annexe absolutely introduces us one after another to all these things, and at last we come to an imported piece of machinery, the printing press with which Mr. J. P. Fawkner turned off the first newspaper printed in Port Phillip—a relic of the past, and a most antiquated looking affair. Less than thirty years ago this clumsily-constructed instrument was brought here to enlighten the settlers; now all the ingenious things around are made in the colony by the men who have settled here. It is a notable fact.

Passing out of the Annexe, we turn to the left down the Main Hall, and come to a long apartment forming the southern wing of the building, and known as

THE PICTURE GALLERY.

In referring briefly to the contents of this room, it is not our purpose to attempt any criticism of the pictures, still less to endeavour to notice

all the works of art exhibited. We shall merely indicate the position of some of the more remarkable, and allude to the general arrangement of the collection. The room is divided by screens into ten compartments, the whole of the space on the walls and screens within convenient range of the eye being covered with paintings, drawings, photographs, &c. As in most picture galleries, a railing has been erected round the room at a little distance from the wall, and the space between the two has been happily turned to account for the display of the magnificent gathering of Australian seaweeds, ferns, land and marine shells, insects, birds' eggs, &c., contributed by Mr. and Mrs. H. E. Pain—a collection which constitutes in itself no mean museum of curiosities. At the end of the room where we enter, the most conspicuous object (next to the large painted cartoon, which some people are said to admire) is a handsome case of stuffed birds, exhibited by Mr. W. Woods. The mounting of these beautiful specimens has been tastefully effected, so as to lend as natural an appearance to the collection as possible. Not far from these winged curiosities is an interesting case of Dr. Bleasdale's, showing the apparatus made use of by mineralogists and others in blow-pipe investigations. Turning now to the exhibits for which the apartment is set apart, we find the first screen, or partition, covered with the Geological Survey maps, and the second and third chiefly devoted to illuminated writings, lithographs, chromo-lithographs, and photographs. On side walls, screens, and in cases between the screens, are photographs upon photographs, their name being legion. The large-sized views of forest scenery by Mr. Cornell are not likely to be hastily passed over, nor those of the Sandridge and Williamstown shipping by Mr. Rider. On the southern wall are suspended a large number of portraits by Perry, Davis, and other photographers. Among those of the former, a coloured likeness of a Scotch terrier, who, it seems, rejoices in the name of "Tom Sayers," makes a most life-like and telling picture; some of Mr. Perry's *cartes de visite* are also conspicuous for their admirable tone and finish. A truthful likeness in colours of Miss Cleveland as *Leah* is exhibited in Mr. Davies' collection, near a wonderfully clear photograph by Nettleton of that marvel of wood carving, the Chinese altar-piece, which during the early days of the Exhibition was on view in the Octagon, but which now adorns the Joss-house at Emerald Hill. The elegant crayon drawings and plaster castings presented by the Government of Italy to the Victorian Board of Education will attract the notice of the visitor at an early stage of his perambulation. Their merit is beyond cavil. Of portrait photographs, Messrs. Johnstone, O'Shannessy and Co. present several admirable ones of large size, and prepared so as greatly to resemble mezzotint engravings. They will be found on the northern wall of the room, not far from the entrance. A little further on, in the fifth compartment formed by the screens, Messrs. Batchelder and Co. have their exhibits, comprising among others a life-sized picture of Judge Barry, and a series of full-length portraits of the Governors of Victoria, from Latrobe downwards. Another series by the same firm, which is deservedly attractive, represents Mr. Lambert, the comedian, in some of his best characters. Facing Batchelder's photographs is a large number of drawings in coloured crayons and sepia by Mrs. Naylor. They represent clusters of fruit, heads of game, rabbits, and the like, and are depicted with remarkable fidelity; some copies of old engravings painted on linen in indelible tints are of rare merit. The next

compartment occupies a central position, and is accessible by a large doorway leading from the Southern Fountain Court. At a stall in the middle of this division Messrs. T. Ellis and Co. exhibit for sale copies of the photographs they have taken of different portions of the Exhibition.

Some of the finest paintings of local artists are to be found in this portion of the gallery. The eastern side is occupied by the productions of Clarke, Gritten, and others. M. Guerard's graphic illustrations of Australian scenery meet the eye when turned to the north. On the southern wall hangs the prize picture of M. Chevalier, representing "The Buffalo Ranges," Gippsland; while on the western side are to be seen a series of admirable studies from the pencil of M. Buvelot, an artist who has but recently taken up his sojourn in Melbourne. Against the northern wall, in the succeeding compartment, hang the New Zealand water-colour drawings, by Mr. Gully, which have met with such general appreciation here; and contiguous to them is placed a well-known picture by Mr. H. E. Davies, representing a scene in the neighbourhood of Launceston. A very beautiful English water-colour sketch, said to be by Turner, is placed close to Mr. Gully's productions. It represents a simple poetical scene, but the details are admirably worked out. Characteristic sketches by Gill, Burrand, and others, face some capital crayon drawings by Mdme. Vieusseux and some of her pupils. Beneath the latter, a pen-and-ink copy of an engraving from one of Landseer's paintings forms a conspicuous feature. The subject is the noble Newfoundland dog, termed "A Distinguished Member of the Humane Society," and it owes its existence to the amateur, but by no means unpractised, hand of Mr. E. L. Montefiore. The next compartment is filled with some of the fine series of water-colour sketches which constitute the magnificent result of M. Chevalier's New Zealand tour. Paintings, mostly of European origin, fill up the two remaining divisions of the room, the full-length life-size pictures of the Prince and Princess of Wales, recently added, proving a great attraction. The principal portion of these imported works were purchased for the Victorian Art Commission, and have been exhibited for many months in the art gallery of the Public Library. Many of these are of a high order of merit, and copies of them, as might be expected, have been made by local artists. One of these, by Miss Thomas, a copy of "Le Depart du Fiancé," is exhibited in the gallery, together with original works both in painting and sculpture from the hand of this talented young lady. At the western end of the gallery is a room devoted to the exhibition of architectural designs, all of which will be found worthy of inspection. Most of our leading architectural firms are represented.

THE BASEMENT.

From the Picture Gallery the visitor will readily discover there is a facile descent to the shades below, where the genius of Messrs. Ellis and Hodgson reigns supreme. No guide is needed to direct to the tempting viands which these enterprising caterers set forth in one of the coolest dining halls in the Southern hemisphere. If the great business of life be to dine, persons attending the Exhibition have good reason afforded them why they should not neglect it.

Although a great part of the basement is devoted to the Baron of Beef and his belongings, it is not actually bereft of exhibits, as the enterprising

visitor will find on approaching the remote extremity of it, where there are apartments filled with wines, beers, and cured meats, sent in for competition. About these we have nothing further to write than that they are said to contain samples of rare quality, upon which, however, the judges must be left to report. Flights of steps from the Basement lead to

THE SOUTHERN FOUNTAIN COURT,

Which has been laid out very prettily with plants and grass, seats and statues surrounding the tasteful fountain constructed of marble by Signor Veroli. Here, as well as in the Northern Court, a circle of lights has been placed around the fountain, so that after dark an excellent effect is produced. Among the objects of taste in this court, the bronze figures of deer contributed by Mr. Degraves are of a particularly imposing character, and add greatly to the elegant appearance of the place.

The southern entrance to the Octagon is approached from this direction, and arriving at it we terminate our circuit of an exhibition which would prove an attraction in any part of the earth, but is a truly marvellous achievement when it is remembered that it takes place in a colony which at the first great English Exhibition was not of sufficient importance to be recognised even by name.

INTERCOLONIAL EXHIBITION, 1866-67.

REPORTS AND AWARDS OF THE JURORS.

The Reports and Awards herewith published are the independent opinions of the Jurors of the several Sections.

Following the excellent rule laid down by the Royal Commissioners of the Great Exhibition of London in 1862, it was decided by the Intercolonial Commissioners that no interference whatever should be permitted, either with the language of the Reports or the nature of the Awards. The decisions herein recorded are given on the sole authority of the Jurors, who are responsible for them.

The only matters added to the Reports consist of Tables of Imports, kindly furnished by the Commissioner of Trade and Customs (the Hon. J. G. Francis), and some short extracts from the Reports of the London Jurors in 1862.

A number of additional Awards have been made by the Jurors since the publication of the first edition; and a general revision of the entire list has also been made. The present publication is therefore submitted as being as perfect as circumstances would allow.* The general editing has been performed by Mr. J. G. Knight.

The time which has elapsed between the closing of the Exhibition and the publishing of these Reports has been exactly three months. The period occupied by the Jurors of the Great London Exhibition in 1862 was upwards of a year.

The whole of these Reports have been furnished gratuitously by the Reporters, to whom the thanks of the Commission, as well as the public, are eminently due.

JOHN J. BLEASDALE, D.D., F.L.S., F.G.S.,
Special Commissioner for Jurors.

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* It is but justice to the Printers of this work to state that it has been executed under very difficult conditions. It was not originally contemplated to publish so much matter, nor to put it into the form of a full volume; otherwise greater uniformity would have been observed in some of the details.

INTERCOLONIAL EXHIBITION, 1866-67.

REPORTS AND AWARDS OF THE JURORS.

MINERAL PRODUCTS.

Class I.—Section 1.

Ores and Non-metallic Mineral Products, Geological Specimens, Building Stones, Limes, Cements, Clays, Salt.

PROFESSOR M'COY, CHAIRMAN.

C. D. APLIN, ESQ.
G. FOORD, ESQ.
J. PANTON, ESQ., J.P.
REV. J. J. BLEASDALE, D.D.
J. C. NEWBERY, ESQ.
R. M. SERGEANT, ESQ.

THE Exhibition is very rich in important specimens illustrative of the Geology and the raw Mineral Products of Australia and the neighbouring colonies, although the variety is not so great as might have been expected. Gold, tin, antimony, and precious stones have been exhibited in profusion; while the building stones, limes, cements, and the more valuable kinds of clay seem very imperfectly, or at least scantily, represented by the contributions of the exhibitors.

In judging the various samples included under the heads of this section, it was frequently necessary to submit portions of them to chemical analysis. This labour was undertaken by two of the jurors, Mr. G. Foord and Mr. Cosmo Newbery, to whom great thanks are specially due for the pains and trouble they have taken with this portion of the investigation. Mr. Newbery has also kindly assisted in the further details necessary for the report.

The principal exhibitors have been awarded medals or honourable mentions, and their names and other particulars will be found in the Lists of Awards. The series of Victorian mineral and rock specimens exhibited by Mr. Selwyn, Director of the Geological Survey, and Mr. Brough Smyth, Secretary for Mines, is of great special interest, as affording the most complete expositions of the state of our knowledge of the mineralogy and lithology of the colony which the resources of the public departments under their control can afford. The Essays of both these gentlemen, and the separate Catalogue issued by Mr. Smyth, are full of valuable information on those topics. The Victorian precious stones or gems have formed the subject of continuous study for several years of the Rev. Dr. Bleasdale, and the exhibition of his collection and the publication of his observations on such as are fit for the jeweller,

have excited great interest, and will probably bring some of the kinds largely into use.

The exhibits of gold have been very interesting and important, and amongst them we may specially draw attention to the following :—

VICTORIA.

The Bank of Australasia exhibited a fine collection of nuggets from the Break-o'-Day Company's mine at Rokewood, the largest weighing 116 ozs. 10 dwts., many over 80 ozs. ; also, specimens of alluvial gold from Ballarat, Beechworth, Bright, Blackwood, Castlemaine, Creswick, Rokewood, Smythesdale, Sandhurst, Talbot, and Yackandandah : the whole collection weighing 1032 ozs. 1 dwt. 6 grs., and valued at £4634.

The Bank of Victoria exhibited granulated gold from St. Arnaud.

A large collection of quartz, containing gold and auriferous pyrites, from the mines at Clunes, was exhibited by the Clunes Borough Council, with which was a fine specimen of scorodite crystallized, on the joint face of a block of quartz.

A pyramid of specimens from the quartz reefs of Tarnagulla, and two or three nuggets, were exhibited by the Borough Council of Tarnagulla.

Messrs. William Clark and Sons, in a well-arranged case of mineral specimens, exhibited several fine samples of auriferous quartz and alluvial gold.

Mr. William Lord exhibited some beautiful transparent crystals of quartz, which contained gold perfectly enclosed.

A large specimen of quartz was exhibited by Mr. G. M. Roberts, from St. Arnaud. The joint face exposed was covered with fine gold.

The Shire Council of Stawell exhibited a case of auriferous specimens. The quartz specimens consist of veined quartz highly charged with pyrites.

The Royal Standard Gold Mining Company, of Woodspoint, exhibited a large mass of highly auriferous quartz ; a large portion of the gold was crystalline.

Mr. E. J. Dunn, in his beautiful collection of Victorian rocks, minerals, and gems, exhibited several samples of alluvial and crystalline gold from Beechworth.

Mr. Johnson Hedley exhibited a valuable collection of gold, gems, and other minerals, from the washdirt of Beechworth.

Messrs. Latham and Watson exhibited a large instructive case of gold and auriferous specimens from their claim, Hustler's Reef, Sandhurst.

TASMANIA.

Mr. J. W. Norwood exhibited auriferous quartz from the Union Company's Quartz Reef, Mangana.

The Royal Society of Tasmania exhibited gold from the South Esk River, near Launceston, and the River Inglis, north-west coast ; a nugget from Fingal, from Ironstone Creek, Huon River, Oyster Cove, and River Hellyer, north-west coast.

SOUTH AUSTRALIA.

Mr. F. C. Singleton exhibited ore containing gold, with sulphides of nickel and silver in iron pyrites.

QUEENSLAND.

A few specimens of auriferous quartz from Peak Downs were exhibited.

NEW ZEALAND.

Mr. J. Dalish exhibited fine samples of gold from the Paki goldfield.

NEW SOUTH WALES AND WESTERN AUSTRALIA.

These colonies exhibited no auriferous ores.

SILVER.

VICTORIA.

The Bank of Victoria exhibited ingots and granulated silver extracted from St. Arnaud ores.

Mr. E. Chaplin exhibited a very instructive case, the arrangement showing the succession of the ores in the lode of the St. Arnaud Silver Mine, and the character of the adjoining "country"—the oxides, with the chlorobromide of silver, extending down to the 200 feet level, and succeeded below that depth by sulphides. The adjoining "country" exhibits similar characteristics, being largely charged with crystals of iron pyrites below the depth of 200 feet.

NEW SOUTH WALES.

The Moruya Silver Mining Company exhibited massive samples of ore, which contain sulphide of silver in connection with arsenical pyrites, galena, and zinc blende.

Mr. Walter Renny exhibited a highly argentiferous galena from Woolgarlo, near Yass.

SOUTH AUSTRALIA.

The Talisker Mining Company, near Rapid Bay, exhibited argentiferous galena, containing 52 per cent. of lead and 34 ounces of silver per ton.

COPPER.

VICTORIA.

Messrs. William Clark and Sons exhibited specimens of copper ores from various localities.

The Gippsland Prospecting Association exhibited some massive blocks of stone containing copper pyrites from their mines. The pyrites is said to yield about 33 per cent. of copper.

NEW SOUTH WALES.

The Cardiangullong Copper Mining Company exhibited rich massive specimens of carbonate, oxide, and sulphide of copper.

The Icely Copper Company exhibited fine specimens of carbonates, oxides, and sulphides.

The Currawang Copper Company exhibited beautiful specimens of dendritic native copper; also black oxide in mass, which is reported to yield 22½ per cent.

SOUTH AUSTRALIA.

A very fine collection of copper ores was exhibited by the proprietors of the Moonta Mines. A good collection of ores and smelted copper was exhibited by the proprietors of the Wallaroo Mines and Smelting Works.

The Hon. H. Ayers exhibited a very instructive cabinet collection of South Australian copper ores.

Another fine cabinet collection was exhibited by Mr. M. Thomas. The ores consisted chiefly of South Australian and Cornish blue and green carbonates.

QUEENSLAND.

A few specimens of copper ore were exhibited by Mr. J. T. Griffin, from Peak Downs.

WESTERN AUSTRALIA.

Mr. J. Drummond exhibited fine specimens of copper ore from Champion Bay.

The Fortune Mining Company exhibited several large blocks of copper pyrites, yielding 20 per cent. of copper. One of the blocks weighed over 7 cwt.

Mr. A. Shenton exhibited a specimen of black oxide of copper crystals—rhombohedral hardness, 3. These are the first rhombohedral crystals that have been noticed; they have a bright lustre, and resemble iron glance in general appearance.

NEW CALEDONIA.

M. Gardier, Government Engineer, exhibited a few copper ores.

IRON.

VICTORIA.

The only Victorian specimens of note were exhibited in the collection of minerals exhibited by the Mining Department, and consisted of red and brown oxides, carbonates, and titaniferous oxide of iron; also small specimens of sulphate, phosphate, and arseniate of iron.

NEW SOUTH WALES.

A few samples of ore were exhibited by the Fitzroy Iron Mining Company.

TASMANIA.

Mr. Charles Gould, Government Geologist of Tasmania, exhibited a fine collection of hematites and magnetic oxide of iron, in all about three tons of iron ores.

The magnetic oxide of iron, from the Ironstone Hills, West Tamar, contains 70 per cent. of iron.

Amongst the brown hematite specimens is the ore from near Ilfracombe Saw Mills, West Tamar. The lead is described as being 22 yards in width; length of outcrop, 300 yards; average incline upwards from the water level, 14 degrees. It is estimated that 350,000 tons of ore lie above the water-level, workable in stopes at a very low rate per ton. The outcrop is about seven miles from the beach.

WESTERN AUSTRALIA.

Mr. W. Coates exhibited massive specimens of concretionary hydrated oxide of iron.

Small specimens of hematites and other iron ores, from Roebuck Bay and the coast ranges, were exhibited by Mr. A. Shenton.

NEW ZEALAND.

The Nelson Committee exhibited a fine sample of magnetic iron sand from Wangapika.

Mr. Thomas Kelly exhibited a box of titaniferous iron sand from the Moturoa Sugar Loaves.

NEW CALEDONIA.

M. Gardier exhibited a collection of chromate and other iron ores.

OTHER ORES.

VICTORIA.

Antimony.—Fine specimens of native sulphide of antimony and regulus were exhibited by the Costerfield Mining Company; by Mr. J. Collins, from Redcastle; and by Mr. E. Elliott.

The following were in the Mining Department collection:—

Bismuth.—In cabinet specimens, as pure metal and carbonate, from Omeo, the Upper Yarra Diggings, and in the neighbourhood of Maldon.

Cobalt.—In small quantities in the manganese ores, from the tertiary drift deposits, and from quartz reefs.

Chromium.—As chrome iron ore, from Heathcote, and as in selwynite from the same locality.

Lead.—Native (?) from the drift deposits, and as galena and carbonate from quartz reefs.

Manganese.—As psilomelane and pyrolusite.

Tin.—Messrs. E. J. Dunn, Johnson Hedley, Edwin Gannell, G. R. Berry, and Henry Bussell exhibited fine samples of tin ore from Beechworth, the ore averaging about 60 per cent. of tin.

SOUTH AUSTRALIA.

Bismuth.—The Murninnie Mining Company exhibited a good collection of bismuth ores and metallic bismuth in ingots.

Cobalt.—Mr. W. Hay exhibited two specimens of earth cobalt, containing eight per cent. of cobalt, and one ingot containing sixty-four per cent. of

copper and twenty-eight per cent. of cobalt, obtained by Thomas and Co.'s patent method for extracting cobalt from its ores.

WESTERN AUSTRALIA.

Mr. A. Shenton exhibited a collection of minerals, amongst which the lead ores were well worthy of notice, being octahedral crystals in fluor spar.

COAL, LIMESTONES, AND OTHER ROCKS AND NON-METALLIC MINERALS.

VICTORIA.

Specimens of coal, from Cape Paterson, were exhibited by the Mining Department; also various lignites and brown coals from Traralgon, Cross-over Creek, Lal-lal, and from a newly-found bed near Traralgon, which is said to occur in a bed near the surface. An examination gives the following results:—

Volatile hydrocarbons	31·74
Fixed Carbon	24·75
Ash	43·51
	100·00

It contains less than one per cent. of water, and yields about 7000 cubic feet of gas per ton.

Limestones.—Messrs. Player and Kitchen exhibited some very fine blocks of limestone from their quarry at Mansfield, well adapted either for building purposes or burning into lime. An analysis of the stone gives:—

Carbonate of lime	95·55
Carbonate of iron	2·92
Carbonate of magnesia	trace
Water	1·00
Loss, insoluble matter and carbon	·53
	100·00

Limestones were also exhibited from St. Arnaud by the Borough Council, and from Geelong, Duckponds, Schnapper Point, Keilor, Kyneton, Yering, Buchan, and Wangaratta, in the collections of the Geological and Mining Departments.

Building Stones.—Messrs. Huxley and Parker exhibited two fine blocks of granite; Mr. W. Harrison, a portal made of freestone from the Barrabool Hills.

The Borough Council of St. Arnaud exhibited granite from Yowen Hill, and some good sandstone from Daliammy Creek.

Mr. H. Thorburn exhibited a very large well-cut flagstone from the Castlemaine Flagging Company's Quarry.

The Shire Council of Stawell exhibited samples of sandstones and freestones.

Mr. Thomas Bates exhibited a good sample of fuller's earth, from Drysdale, which proves on analysis to be a hydrated silicate of magnesia.

Mr. J. Stevens exhibited clean and even slates from Beechworth.

Mr. A. Morgan exhibited variegated slates from Beechworth.

There were several other exhibits of roofing slates, fire-clays, fire-bricks, kaolin, and other clays, but none demand any special notice.

The Rev. J. J. Bleasdale exhibited a beautiful collection of colonial gems, cut and polished and in the rough, contrasted with gems from other parts of the world.

Mr. R. Brough Smyth, Secretary for Mines, exhibited the collection of minerals of the Mining Department, consisting of mineral rocks and fossils, 526 specimens; auriferous quartz, 279 specimens; also a very valuable foreign collection of minerals and rocks, with illustrative models of crystals in wood; in all 1811 specimens.

Mr. A. R. C. Selwyn, Director of the Geological Survey of Victoria, exhibited a collection of rocks collected by the Geological Survey. The collection contains specimens of all the stratified and plutonic rocks of the colony, arranged in their geological order; the label of each specimen, besides bearing the name and locality, is marked with the colour which represents the rock on the geological maps.

Mr. E. J. Dunn exhibited a very valuable collection of minerals and gems, chiefly collected in the Ovens district.

Mr. George M. Stephen and Mr. J. Hedley exhibited fine collections of gems and precious stones collected in the colony, consisting of diamonds, sapphires, topazes, garnets, spinels, gold crystals, tourmaline, &c., &c.

NEW SOUTH WALES.

Coal.—The Lambton Colliery Company exhibited a very fine block of coal from their colliery at Newcastle. Fine specimens were also exhibited by the New South Wales Commissioners from the Hunter Coalfield, consisting of coal from the Stony Creek, Dalwood Creek, Rix's Creek, Mitchell's Creek, and Anvil Creek mines.

Mr. William Keene, Government Examiner of Coalfields, exhibited specimens of the fauna and flora overlying the above seams; also specimens of coal, and a block of brown cannel coal or kerosene shale from Colley Creek, Liverpool Plains.

The Hartley and Western Kerosene Oil companies exhibited very fine blocks of the kerosene mineral from their mines at Hartley.

Mr. J. Graham exhibited a block of kerosene shale from Wollongong, and oils extracted therefrom.

The Rev. W. B. Clarke exhibited a collection of specimens from the Wranamatta and Hawkesbury rocks, overlying the productive upper coal measures of New South Wales, and exhibiting the proper stratigraphical position of the palæozoic fishes discovered by him.

Mr. C. H. Faucett exhibited a large specimen of the so-called colonial meerschaum, from Richmond River. It is an infusorial earth, very light, floating on water, and shows infusorial forms under the microscope. It would be useful as a tripoli or polishing powder.

Some specimens of limestone were exhibited from the Bathurst district, but none of any particular note.

TASMANIA.

Coal.—Mr. A. Howden exhibited a fine collection of Tasmanian coals and lignites; amongst which were—I., anthracite from Newton; II., coal

from Rokewood; III., coal from the upper and lower seams at Seymour. An analysis gave the following results:—

	I.	II.	UPPER. III.	LOWER. III.
Volatile matters	6·654	6·728	30·539	26·861
Fixed carbon	76·383	83·234	61·230	52·434
Ash	16·963	10·038	8·231	20·705
	100·000	100·000	100·000	100·000

The Newton coal (I.) was a bright-black anthracite, much jointed, the joint faces being coated with carbonate of lime, from which it was freed as much as possible before analysis.

The Rokewood coal (II.) was of a dull black colour, and slaty fracture; it burned at first with a slight smoky flame, and like a true anthracite.

The upper seam of Seymour coal (III.) was of a dull black, with thin bands of bright black coal passing through it. It forms an excellent coke, 69·461 per cent. The lower seam of Seymour coal gives a moderately good coke.

Mr. Charles Toby also exhibited fine blocks of the Seymour coal, and most excellent fire-clay from the Seymour mine.

Limestone.—Various samples of limestone were exhibited from Ilfracombe, Lindisfarne, Port Arthur, Sorrell, and Exton.

Sand for glass-making was exhibited from Port Arthur. It contains many ferruginous grains, which would detract from its value for the finer varieties of glass.

The Royal Society of Tasmania exhibited two hundred beautiful topazes from Flinders Island, and fine specimens were exhibited from the same locality by Mrs. Sarah Crouch.

Tasmanite.—Several large blocks of this mineral were exhibited.

NEW ZEALAND.

Coal.—The West Wanganui Coal Company exhibited a very fine sample of coal from their mine at Wanganui. Good samples of coal were also exhibited from the Nelson and River Bulla mines.

Graphite.—Mr. C. Weisenhaven exhibited specimens of graphite from the Province of Nelson. It contains a larger percentage of ash than that used for the manufacture of lead pencils, but would be very valuable for the manufacture of crucibles. It may also be freed to a great extent from impurities, by treating with chlorate of potash and sulphuric acid, and then used for pencils.

Mr. W. C. Ancell exhibited a fine specimen of native alum from Otago.

Mr. J. H. Baker exhibited a fine collection of sands, plantinum, and other minerals.

Mr. J. W. Tatton exhibited a collection of chromes, manufactured by him at Nelson. The collection was interesting, as it showed the various processes in preparation.

SOUTH AUSTRALIA.

Coal.—Some small samples of coal from Port Lincoln were exhibited, but they were accompanied with no data.

Bitumen.—The Hon. J. Hodgkiss exhibited some samples of the mineral caoutchouc, found near the Coorong. The point is still in dispute whether

this is a true ellaterite. If the quantity is large, it may have many economic uses. It is in thin layers, in depressions on the surface near the coast.

WESTERN AUSTRALIA.

Ochres.—The Central Committee exhibit crude, yellow, red, and umber coloured ochres, useful as paints; the latter burns into a good red pigment.

Mr. P. Wallcott exhibited a most interesting series of bitumens, resins, inflammable amber-like minerals, peat, and chalk. The inflammable substance is of a dark-brown colour, resinous fracture, and soluble in alcohol. The bitumen or asphaltum is free from sulphur compounds, and is therefore of value if occurring in quantity. One of the resins closely resembled copaline; on distillation it yielded an oil like oil of amber; the specimen was marked amber. A second, also marked amber, seems to represent a transitional change from the former, which again seems connected with the specimens marked "peat," which consist of sand grains coated and cemented by a peaty substance, soluble in potash. All these are found in beds near the coast.

Mr. A. Shenton exhibited a very interesting collection of rocks and minerals from Western Australia, amongst which were specimens of coal from Irwin River; gypsum from Shark's Bay; iron pyrites from Nichol Bay; and copper, iron, and lead ores already mentioned.

GEOLOGICAL SPECIMENS.

The only general geological collections—besides the departmental ones of Mr. Selwyn, the Director of the Victorian Geological Survey, and Mr. Smyth, the Secretary for Mines, above referred to—requiring special notice are those of the Rev. Mr. Clarke and Mr. Skene, illustrative of the geology of the coal districts of New South Wales. Both of the latter collections are remarkable for the entire absence of any specimens supporting the views of the exhibitors as expressed in several recent papers, they having stated that palæozoic coal plants, as stigmaria, sigillaria, &c., were abundant in these deposits; but there is not a trace of one genus or the other in either collection, nor any evidence of the well-known plants of mesozoic facies being really intercallated with true palæozoic fossils. The collection of Mr. Clarke is remarkably rich in portions of fossil fish, but their general aspect is that of triassic or permian fish rather than of palæozoic carboniferous ones. The collection is a most interesting and valuable illustration of Australian geology.

Appended is a List of Awards in this section.

FREDK. M'COY, CHAIRMAN AND REPORTER.

MEDALS.—VICTORIAN COURTS.

4 Bank of Australasia.—For Specimens of Gold and Nuggets from various Victorian goldfields.
4*a* Bank of Victoria.—Specimens of Granulated Silver and Ingots of Silver from St. Arnaud; and Sample of Granulated Gold.
6 Bleasdale, Rev. J. J., D.D.—Colonial Gems.*
a Huxley and Parker.—Two large Blocks of Granite, from Harcourt.

* Medal declined, being one of the Jurors.

a10 Selwyn, A. R. C., Director of the Geological Survey.—Collection of Rocks and Minerals.
53 Smyth, R. Brough, Secretary for Mines.—Collection of Mineral Rocks, Fossils, Auriferous Quartz, and Ores.
47 Spink and Sons, 100 Collins-st. East.—Precious Stones of various descriptions.
13 St. Arnaud Mining Company.—Section of the St. Arnaud Silver Lode.

HONOURABLE MENTION.—MELBOURNE COURT.

8 Borough Council of Clunes.—Samples of Quartz from the mines of Clunes.
— Borough Council, Dunolly.—Block of Granite, and other Stones.
58 Borough Council of St. Arnaud.—Granite, Sandstone, and Limestone.
9 Borough of Tarnagulla.—Specimens of Auriferous Quartz, Crystals, &c.
14 Clarke, William, and Sons.—Mineral Specimens, principally Victorian.
15 Collins, John.—Antimony Ore, from Redcastle.
68 Elliott, E.—Specimens of Antimony.
21 Field, E.—Antimony Ore, from Costerfield Gold Mining Company.
35 Harrison, William.—Freestone, from M'Cann's Quarry, Barrabool Hills.
32 Lord, William.—Crystals containing Gold.
— Lyons, J. C.—Lignite and Peat.
33 Macdonald, Mrs. C., Lake Bolac.—Natural Salt and Crystals.
81 Masters, John.—Bar of Native Copper.
47 M'Roberts, G.—Specimens of Auriferous Quartz.
42 Player and Kitchen.—Limestone, from Mansfield.
45 Rapson, S. S.—Thirty Samples of Quartz Tailings.
48 Robertson, William.—Marble, from Port Curtis, Queensland.
a8 Royal Standard Gold Mining and Crushing Company.—Large and rich Block of Auriferous Quartz.
55 Stawell Shire Council.—Auriferous Quartz, Gold, Sandstone, and Freestone.

MEDAL.—SANDHURST COURT.

7a Latham and Watson.—Gold and Specimens from the Hustler's Reef; is in full work, and rich.

MEDALS.—BEECHWORTH COURT.

5 Dunn, Edward John.—Collection of Ovens metallic and non-metallic Minerals, Auriferous Quartz, Tin Ore, and Gems.
9 Hedley, Johnson.—Collection of Washdirt, Gems, and Tin Ore.
14 Stephen, George Milner, F.R.S.—Gems and Precious Stones.

HONOURABLE MENTION.—BEECHWORTH COURT.

1 Berry, George R.—Tin Ore.
2 Bussell, Henry.—Collection of Tin Ore, Gems, and Stones.
7 Gannell, Edwin.—Tin Ore and Smelted Tin.
15 Stevens, John.—Slate.

MEDALS.—NEW SOUTH WALES.

5a Clarke, Rev. W. B., F.G.S.—Collection of Minerals, Fossils, and Geological Specimens.
23 Commissioners of New South Wales.—Coals, contributed by Messrs. Mitchell, Elliott, Wyndham, Farthing, and Russell.
25 Hartley Kerosene Oil and Paraffin Company.—Shale, from their mine at Hartley.
14 Keene, William, F.G.S.—Geological and Fossil Specimens, and Coals.
16a Lambton Colliery Company.—Coal, from their colliery at Newcastle; block
16 Manning, James.—Fire Bricks.
of Lambton Coal.
27 Western Kerosene Oil Company.—Kerosene Minerals.

HONOURABLE MENTION.—NEW SOUTH WALES.

11 Graham, John.—Block of Kerosene Shale, from Wollongong.

MEDALS.—TASMANIAN COURT.

11—16 Gould, Charles, Government Geologist, Tasmania.—For a highly significant collection of massive samples of the Iron Ores of that colony.
21 Howden, Archibald.—Twelve Samples of Coal, with Shale and Lignite, from various parts of the colony.
67, 68, 22, 23 Toby, Charles.—Fire Clay from the Seymour Coal Company, the Clay prepared, and Coals.

HONOURABLE MENTION.—TASMANIAN COURT.

72 Boyd, J., Port Arthur.—Fine and Coarse Salt.
587 Crouch, Mrs. Sarah.—Topazes from Flinders Island.
10 Norwood, W. J.—Quartz containing Gold from Company's Reef at Mangarra.
26 Royal Society of Tasmania.—Topazes from Flinders Island.

MEDALS.—SOUTH AUSTRALIAN COURT.

42 Ayers, Hon. H.—Cabinet Specimens of Copper Ore.
85 Murninnie Mining Company.—Bismuth and Plumbago.
36 Proprietors of Moonta Mines.—Copper Ores.
37 Proprietors of Wallaroo Mines.—Copper Ores.

HONOURABLE MENTION.—SOUTH AUSTRALIAN COURT.

86 Hay, William.—Cobalt and its Ores.

MEDAL.—WESTERN AUSTRALIAN COURT.

9 Fortune Mining Company.—Copper Ore.

HONOURABLE MENTION.—WESTERN AUSTRALIAN COURT.

8 Drummond, J.—Specimens of Copper Ore.
19 Shenton, George.—Specimens of Copper Ore.

MEDAL.—NEW ZEALAND COURT.

2 Baker, J. H.—Samples of Sands, Stones, &c.
16 Nelson Commission.—Pillar of Coal, showing thickness of seam, from River Bulla.
13 West Wanganui Coal Company.—Samples of Coal from Wanganui.

HONOURABLE MENTION.—NEW ZEALAND COURT.

1 Ancell, William C.—Specimens of Alum.
5 Dalglish, J.—Sample of Gold from Paki Goldfield.
8 Kelly, Thomas.—Titaniferous Iron Ore, and Clay, Soils, and Rocks.
10 Nelson Coal Mines.—Samples of Coal.
27 Tatton, J. W.—Chromes.
14 Weisenhaven, C.—Specimens of Plumbago.

CHEMICAL AND METALLURGICAL PRODUCTS AND PROCESSES.

Class I.—Section 2.

GEORGE FOORD, ESQ., CHAIRMAN.

REV. J. J. BLEASDALE, D.D.	JAMES HARRISON, ESQ.
JOSEPH BOSISTO, ESQ.	J. C. NEWBERY, ESQ.
W. H. GOSSAGE, ESQ.	W. JOHNSON, ESQ.

THE jurors of Section 2 of Class I., representing Chemical and Metallurgical Products and Processes, experience a pleasure in presenting their report to the Commission; for, in reviewing the exhibits in this section, they have been impressed with the foreshadowing of the future chemical manufactures and metallurgic industries of these Austral colonies, rendered patent in this first Melbourne Intercolonial Exhibition. Considering it opportune, they take advantage of the occasion to record an expression of their views concerning those conditions which act as disposing causes, stimulating or modifying the growth of industries of the kind now considered in a new country, and which, thus related to our future prosperity, are therefore worthy of most careful consideration.

It may be observed that one of the most important characteristics of the family of colonists is, that the people who arrive at new shores bring with them the knowledge of the arts of life of the parent countries, and that they are prepared as occasion may arise, and according to the urgent dictation of circumstances, either to transplant these arts in their integrity or to apply them in a modified form, under new conditions of climate, of supply and demand, and of the monetary equivalent of wages, for utilizing the new products of the three great domains of nature. Or, in other terms, they come prepared to graft the manufactures of an old country on to the resources of a new, and to employ the methods of an established civilization for the working out of new economic problems—for the subjugation and appropriation of the natural resources of a new country, according to methods already sanctioned by continued successful application in the old.

To the pioneer of civilization, arrived in his new home, having become the master of its natural resources, and prepared to use the new acquisition according to his wants, an important distinction soon thrusts itself upon his attention. The *fauna* and *flora* of each country he sees ruled by climate and by those laws which control the distribution of species; while the mineral, or rather the inorganic, kingdom is found by experience to be altogether independent of modern climate, and, in a general sense, the same for all countries, whatever their latitudes or however widely apart. In his new abode the colonist finds a new vegetation and a new phasis of animal life; but the sea and the rivers, however different in external physiognomy, are virtually the same as those which he has left: the sea-water contains exactly the same salts, in almost mathematically the same proportions, and the river-waters are mineralized in the same way, and for the most part with exactly the same minerals, as those in other parts of the world. The new landscape shows outlines of hills, speaking characteristically of familiar mineral formations. He recognises at a glance the old, well-known basalts, trachytes, greenstones, porphyries, and

granites, and the familiar sandstones, clay slates, limestones, and marls. He finds veins in the rocks charged with the common ores of iron, copper, lead, and tin ; he may find any of these in more or less abundance than that which has obtained in his old home, but the minerals themselves are undistinguishable from those of the opposite hemisphere, of other continents, or of other latitudes. A greater or less abundance of particular useful mineral substances will so far modify the manufactures of a new country ; but in the broadest sense the chemical manufacturer will have to deal with the same sulphur, pyrites, and sea-salt, and the metallurgist with the same copper pyrites, galena, hæmatite, and blende, quite irrespective of geographical position, in whatever part of the globe he erects his furnaces. Whenever the mineral product bears impress of an organic origin, as in the case of coal, then minor distinctions, due to the original organic form, are apparent ; but even in this instance the coals of different countries admit of a classification which is altogether independent of the relations of modern climate, or of geographical distribution. It is in accordance with this, too, that the naphthas derived from the bituminous shales of New South Wales are the same as those obtained from the minerals of the oil districts of the United States.

But the manufacturer, regarding the animal and vegetable kingdoms as sources of raw materials, is differently placed. In the vegetable kingdom new species and even new varieties will afford new resins, new essential oils, new alkaloids, new barks and vegetable acids ; and oftentimes, on the other hand, they become new sources of well-known useful vegetable products. The present Exhibition affords an example of this latter case, in which the grass-tree *(Xanthorrhœa Australis)* is made to yield alcohol, varnishes, and picric acid. Many years since, when the picric acid, a valuable yellow dye, was prepared from the expensive drug indigo, it was pointed out by Dr. Stenhouse, who is so high an authority concerning vegetable proximate principles, that as soon as the grass-tree resin, at that time almost a curiosity in Europe, could be obtained in abundance, it would form a valuable source of carbazotic, or picric acid. This instance may be accepted as an example of the manner in which chemical manufactures are advanced by the accession of new raw materials, but the illustration when fully considered affords also another useful lesson : for, while waiting for the supply of grass-tree resin, another cheap source of picric acid has been found in the heavy coal-tar oils, and the manufactures from these two very different sources must now stand or fall in competition with each other.

In the animal kingdom, notwithstanding its endless variety, the proximate principles available for chemical manufactures have not, it must be confessed, the extent of variety observable as pertaining to vegetables. Admitting a multitude of cases, of which cochineal, kermes, musk, and cantharides afford examples ; and admitting further that the fats and oils of different animals contain often different fatty acids, and have different melting points, disposing them for different uses—still it must be also admitted in reference to the latter examples, that soaps can be made from any of these fats, and that they can be substituted for each other in a large number of their applications.

The great abundance of animal and vegetable raw materials often affords peculiar advantages to the chemical manufacturer in a new country. An instance of this kind is afforded in the vast American pine forests as a source of potash, turpentine, and resin ; while the manufactures of maple

sugar, caoutchouc, and gutta-percha may be cited as of a similar nature. But a general abundance of the kind here mentioned is usually not unattended with waste in the application, and it is to be regretted that the entire tree is too often sacrificed for sap or bark; that the entire animal is slaughtered for its fat or skin, or for one particular organ; and that in the latter case some good practical method of converting the whole body—of the whale, for instance, or, to take our own case, the entire carcase of the kangaroo—to useful account, has not been worked out. To solve this economic problem—to contrive an efficient process, applicable alike for the vast herds of buffalo on the American prairies, and for those of zebras, gnus, and elephants of the African continent—to economise the myriads of sea-fowl and overwhelming shoals of fish occasionally at command, would be one of the highest triumphs of applied science.

In comparing the incipient manufactures of a new country with the firmly-established industries of the older centres of manufacture, it may be useful to pay attention to one or two of those more obvious disposing causes which experience has shown to affect the progress of the latter. It is found, for instance, that manufactures are largely dependent on each other. The chemical manufacturer must have glass and earthenware for his vessels. His requirements in this respect are constantly tasking the highest skill of the potter or glass maker; while, conversely, the bottle-glass maker never thrives so well as when in the neighbourhood of the gas-works, the soap maker, and the chemical manufacturer—not because he depends on them as customers, but because the practice of his art is founded on the use of waste products of these several works. But these relations are more extensive than this; they do not apply to the subject of waste products alone, for, as we shall presently endeavour to show, the finished products of one manufacture becoming a starting-point for another, and all are mutually related as members of an extensive commonwealth.

The manufacturer starting in a new country is, to a great extent, at a disadvantage in these respects. He has often but a limited market for his goods, their adaptation for other manufactures has not yet taken place, and his waste products are such in the fullest sense; for the channels by which they are to be turned to subsidiary profitable account are wanting. There is, besides, another point which largely affects his position, and which may be expressed in the following terms:—Every well-established centre of a given kind of manufacture becomes, in a certain sense, the school of that manufacture. We shall not be going far from our subject to take the English district known as the potteries (including Stoke, Longton, Burstem, Etruria, &c.) as an example of a school of that art. There all the knowledge resulting from the labours of Wedgwood is extant; there all the arts which collectively constitute the ceramic art are separately pursued. The operations of the flint and colour mill constitute a separate calling. The manufacture of the particular kind of paper used for transfer printing on earthenware occupies a large mill. Borax-refining, conducive to glaze manufacture, is practised there. The composition of vitrified colours is a separate trade. There are potters' lathe and tool makers, and the workshop where the everlasting willow-pattern is perpetually cut on copper plates, to replace others which are perpetually wearing out. There is no subject concerning porcelain, delf, or earthenware, about glazes, bodies, kilns, muffles, or seggars, about throwing or moulding,

about enamelling or gilding, on which a prime authority could not be found in that district. So when the potter leaves his Staffordshire home in order to pursue his avocation at the antipodes, it should be remembered that he has, in some respects, parted with his birthright, and that, in his newly-adopted country, his new privileges and facilities bear a heavy discount, due to the sacrifices of the isolate position which he has accepted.

In chemical manufactures generally the case is throughout substantially the same; removed from the smoky, practical, scientific atmosphere of Lancashire, the manufacturing chemist leaves behind him many local advantages, and, among others, that strength which belongs to united, kindred labours. But his difficulties of the kind indicated, however great at the commencement, become gradually vanquished by perseverance, and ultimately the scion becomes as stout and vigorous as the stock. Thus industries may be transplanted, and thus, in the particular instance of the extension of the chemical industries, there is, as we have already indicated, a natural progression, which we shall presently proceed to illustrate by examples, premising in this place that the science of chemistry proper is the seed-corn of applied, and especially of manufacturing chemistry. The science is the substructure of the art, and no branch of human knowledge is richer in examples of apparently recondite studies becoming the basis for manufactures of magnitude and importance. Examples are not wanting. Chevreul, by years of research, developed the modern knowledge of the nature of fatty substances, out of which work, at first sight so apparently unpromising, has sprung important improvements in nearly every manufacture of which fats and oils are the subjects. The stearine and composite candle manufactures are thus based on the researches of Chevreul, and the modern theory and practice of soap-making are no less indebted to the results of those prolonged investigations.

The example just quoted is that of an accomplished fact, but the same thing is continually progressing, and from the experiences of to-day we may easily choose a transitional example. One of these is afforded by the penetrative investigations of Graham on liquid diffusion, which have already furnished the manufacturer with the method of *dialysis*, affording an excellent practical way of separating chemical substances out of complicate mixtures, from which they were hitherto recoverable only by tedious or expensive means; and similar researches on gaseous diffusion by the same profound chemist are already promising results of the last importance to metallurgy. Often what appears as inapplicable to practice seems so on casual observation alone; the extent of its utility is not perceived when the field of vision itself is narrow and confined. Broad facts in science may be too large, and their actual, practical significance too deep, for conforming to petty views of immediate application. The chemist's analyses of a great variety of natural subjects, his syntheses of these into new and definite compounds, his estimation and classification of the properties, physical and chemical, of all these, affords a garnered store of facts and materials, out of which the wants of a progressive civilization are continually, and in most cases adequately supplied. The very extensive list of substances and properties thus awaiting an useful application, so far from arguing the inutility of the abstract researches by which they have been discovered, has in reality quite an opposite significance. We have so often availed ourselves of the aid of chemistry in thus furnishing the requirements of our advancing state, we so steadily continue to select for our

wants from the array of these new discoveries, that we substantially admit the prospective utility of the rest; while our having so large a range out of which to supply our wants is an additional advantage affording full assurance that we shall be closely fitted, and a proof of the fecundity of this science, of which we are at all times so ready to avail ourselves. Yesterday we found an use for chloroform, which had waited years on the list of unapplied compounds; to-day, in the same way, we find in magnesium a ready means for obtaining a brilliant illumination; and to-morrow we shall make further applications of the same nature.

But there is as we have stated a natural sequence in the development of chemical manufactures, an order in which they can and indeed must appear; this will be seen to follow from what has been already stated concerning the mutual dependencies of these arts. The making, or at least the refining, of nitre, and the refining of sulphur, must precede the manufacture of gunpowder, and a ready access to nitric acid paves the way towards making both gun-cotton and nitro-glycerine. We must have oil of vitriol for the manufacture of phosphorus, and ammonia or potash at our right hand in order to make the more common kinds of alum. To go more into detail, it may be stated that two or three chemical substances afford the master key to all the passages and chambers of the palace of chemical industries. Sulphur, or (as the Sicilian monopoly of that article taught the British manufacturer) pyrites, the equivalent of sulphur, is necessary for the manufacture of oil of vitriol; a little nitre is also required. Obtaining oil of vitriol, we can now purchase bones, and supply the farmer with one of his most valuable manures—namely, "superphosphate" of lime. The manufactures of glue and bone fat for the soap maker come into this second step of these manufactures as a subsidian process. Our oil of vitriol at once affords a start for the manufacture of aërated waters, and it aids the blacking manufacturer, and some other pursuits of similar calibre.

But with oil of vitriol we can convert common salt into sulphate of soda, and thus we inaugurate the manufacture of carbonate of soda from brine, pursuing one of the most useful discoveries with which chemical science has ever enriched the arts of life. Obtaining carbonate of soda, we can now manufacture all the useful salts of soda, and we have, in fact, become independent of all other sources of this alkali. We can now force our soap manufactures into a most robust growth; we can further obtain a basic silicate of soda; and as this silicate of the alkali has the same detergent qualities as the compounds of soda with the fatty acids, we can to a great extent supersede the necessity of fats and oils for this branch of our industries. Our oil of vitriol also enables us to commence the stearine candle manufacture. But our manufacture of carbonate of soda also affords a supply of hydrochloric acid; this becomes an economical basis for the fabrication of bleaching powder, and thus facilitates paper making, and the several arts which concern textile fabrics. Every one of these manufactures stimulates and assists the others, and under their patronage the chemical glass maker and potter flourish, for they afford him a permanent trade foundation on which he pushes his enterprise into other channels. With the ammoniacal liquor of the gasworks, and with oil of vitriol, we furnish the agriculturist with sulphate of ammonia, a most excellent administrant of nitrogen to the soil, and therefore a valuable stimulant of his crops; and this sulphate of ammonia, moreover, becomes the basis of the important ammoniacal alum manufacture. Where the lemon flourishes,

oil of vitriol would enable us to produce a merchantable citric acid; and similarly, where the grape is cultivated tartaric acid may be in a similar manner prepared. But examples are almost endless, and the illustrations already given sufficiently establish the proposition which we have advanced.

We have not alluded to the minor manufactures of the finer chemical preparations, to those more delicate, but not more interesting chemical compounds which find an use in the laboratory, or which pertain to pharmacy, photography, or the decorative arts, to the important preparation of the alkaloids, and the extraction and manufacture of essences; it will be sufficient to assert that these also are the outer ramifications of the same growth, and that for their conduct they mostly enlist the use of those staple chemicals which we have enumerated as being manufactured on so large a scale, and as being of so universal an application.

As an instance of the progressive growth of a manufacture, it may be permissible to cite one other concluding example—that, namely, of coal-gas manufacture. It is particularly instructive as an illustration of the certain progressive character of these chemical industries; and it shows, moreover, into what a wide range of uses the waste products of a single manufacture may extend. At the commencement of the present century, the scheme of lighting by coal-gas was smiled at as the proposition of a visionary; yet, by a little helpful patronage, and by the inherent vitality of the scheme itself, it has made way, and become a method of world-wide adoption; and what was, in its first reception, regarded with alarm is now admitted to be the safest, cleanest, and most healthful of all accessible modes of lighting. The bye products of this method are gas coke (an useful form of fuel, with which we could no longer dispense); a fetid tar, inferior to that of the spruce pine; gas lime, foul with sulphur compounds; and an ammoniacal liquor. From the latter, all the salts of ammonia—its carbonate, sulphate, and sal ammoniac—are obtained; the latter, which was once regarded as a precious substance (being at that time sublimed in small quantities from camels' dung), is now plentiful and cheap, and of multiform use. From the coal tar we obtain not only etherial naphthas for solvents and for our lamps, but carbolic and cresylic acids—substances valuable as antiseptics; and, besides these, a long array of tar dyes—substances with which wool, cotton, silk, feathers, even soaps, may be dyed, with colours, in most cases, as brilliant, and, in some cases, more brilliant, than those obtainable from any other known source. The fetid, sluggish coal tar,

"Like the toad, ugly and venomous, bears yet a precious jewel in its head."

The pitch of the tar distiller is handed over for asphalt pavement, and for other uses, while the beautiful, fragrant, pearly naphthalin, with anthracin and crysene, have been long awaiting a proper vocation, but will soon, if we may judge from their endowments, become ennobled for services of importance.

Applying, then, these views (which, however imperfectly, we have yet earnestly endeavoured to convey) as an interpreter of our own industrial position and prospects—those, namely, of the sister colonies and of Victoria—we may catalogue our combined resources in the following manner:—We have abundance of fuel, an unlimited supply of wood, *especially if we plant systematically to cover our consumption;* we have plenty of coal, good lignite, and a superior quality of bituminous shale.

There is native sulphur in New Zealand, and iron and copper pyrites as a source of sulphur in Victoria, as well as in other places. South and Western Australia are well provided with ores of copper, lead, and bismuth, and there is good evidence of the prevalence of cobalt ores. The tin ores of Victoria are inferior in their quality to none. Iron ores are everywhere abundant; the magnetite of Tasmania contains 70 per cent. of metal, and is the proper mineral for converting into the higher qualities of steel. We have in different parts limestone, porcelain and pottery clays, lake salt, and gypsum. The coal measures of Tasmania yield the usual fire clays, which are also in all probability present in other localities, wherever real coal beds exist. Our gold ores it is scarcely necessary to mention—we have a world-wide celebrity for them, and there are ores of silver in South Australia, Victoria, and New South Wales. New Zealand has recently promised to furnish platinum for our vitriol stills, and for other chemical uses. We have abundance of antimonite, manganese is not absent, and useful ores of chromium exist in New Zealand. We have an unlimited extent of grazing ground as a source of phosphorus, and, admitting the want of pine forests, we have other well-known stores of potash, with sea-water as a source of soda, on which to build up the chemical industries of the Austral group.

The foregoing list is confessedly a crude and imperfect one. In it we have made no reference to the resources of either Queensland or New Caledonia, and we have intentionally passed over many natural products useful in the metallurgic and chemical arts. In a few years, with further discoveries, many additions to the list of our natural resources of this kind will without doubt be made. It will therefore be apparent from our examples that the future manufactures of these countries will be established on the basis of ample natural resources. Should it finally appear that we are deficient of cinnabar, and a few other useful minerals, the necessity of a supply of these or their products from without, will not be without its benefits in the maintenance of a healthful and generous commerce.

We have, moreover, in the various climates of these colonies the means of cultivating successfully a great variety of those plants which yield medicinal principles or useful chemicals—resins, gums, starches, sugars, oils, alkaloids, vegetable acids, and the various astringent principles and dyes (on which subject the reader is referred, for substantial information, to the documents of Dr. Ferdinand Mueller, Government Botanist, &c., printed in this series, and exemplified in the Exhibition by products and preparations from his phyto-chemical laboratory). With these facilities we commence our career—that, namely, of the chemical manufactures of the fifth division of the globe. As yet we have made no remarkable progress, yet there is good evidence of a fair beginning. Melbourne vies with Sydney in the manufacture of oil of vitriol, and other mineral acids, on a creditable scale. We have samples of carbonate of soda and silicate of soda of Melbourne make. We have soap manufactures shown in samples of great beauty and excellence. Indeed, this manufacture appears to have developed to a tolerably advanced state, as it includes, among other examples, the excellent silicated soaps of Messrs. Gossage Brothers, which may be mentioned as presenting the most modern phasis of the soap-maker's art, and which, with colonial-made silicate and carbonate of soda exhibited by that firm, are of very high chemical interest, and deserving of unqualified commendation. Both Sydney and Melbourne exhibitors

show kerosene shale products of excellent quality, and manufactured on the great scale; and one of the Sydney exhibitors has forwarded a large block of paraffin from the same source. These examples are sufficient for showing the present condition of our chemical manufactures on the large scale, and to afford the indications of a healthful and promising commencement of these industries. Let it be hoped that they constitute the germs of future manufactures which shall rise in importance until they rival those of Europe, and until they are accepted as the natural source of supply for adjacent countries and for the southern hemisphere—a result which the central position of these colonies, their natural endowments, and the energies of the people would appear to promise.

Concerning minor chemical manufactures—those, namely, of pharmacy and photography*—the following memoranda may be received as indicative of their present development and condition, so far as it has been demonstrated in the first Intercolonial Exhibition.

Admitting that the chemical and pharmaceutical preparations used in medicine have but a slender representation at the hands of colonial makers, we opine that this most probably arises from the present circumscribed demand, together with the absence of medicinal plants—a want long felt by pharmaceutists. We have exhibitors under this class—representing Victoria, 7; Tasmania, 2; New Caledonia, 1. To subdivide the 10, we have representing pharmaceutical chemistry, 8; imported chemicals, 2; some of these being also manufacturers of mineral waters. From the nature and fair average quality of these exhibits, we have the assurance that this branch of manufacture is receiving careful attention; we are further led to infer from many of them that, were the cultivation of medicinal plants attended to on a moderate scale, our pharmaceutical chemistry would soon extend to the production of many chemical, pharmaceutical, and other medicinal preparations, at present received from Europe.

Passing to particular illustrations; in the case exhibited by Mr. Francis, we notice one article as worthy of special recognition; it is the *liquor taraxaci*, from *Taraxacum officinale*, or dandelion, grown at Preston. So also in Mr. Slater's case (Class III., Section 9), opium, from *Papaver somniferum*, or sleeping poppy; and *elaterium*, from *Ecbalium agreste*, or spirting cucumber: these exhibits fully bear out our remarks concerning the requirement for the cultivation of medicinal plants. Some preparations which the old school of pharmacology has introduced, and which have stood the test of time as remedial agents, are found here as chief exhibits—viz., *spiritus ætheris nitrici*, or sweet spirits of nitre; *sp. ammoniæ aromaticus*, or sal volatile; *liquor ammoniæ fortior*, or strong solution of ammonia. These have been found to answer the tests applied to them, and may be said to be in most cases equal to those imported.

The granulations of the chalybeate salts are well prepared by Messrs. Weaver and Co., so also are those of Mr. Francis. Scale preparations of iron, quinine, and ammonia in Mr. Hood's collection deserve notice; here also we have some good chemicals and an excellent exhibit of soft soaps,

*The jurors of Section 2 of Class I. are indebted to the special knowledge of Mr. Bosisto concerning many points in reference to the pharmaceutical department of this section.

including six descriptions—soap from fish oil, tallow oil, linseed oil, and olive oil, also a soap fragrantly scented, and another termed patent soft soap for wool-washing. These exhibits are, perhaps, somewhat outside of this department, save the one from olive oil, but, as forming part of a chemical series, we note them as transparent, very soluble, well-figged, and possessing tried detergent qualities: the olive oil soap, B. P., is choice, and entirely soluble in spirit. The chemicals exhibited by Mr. Johnson, all of his own manufacture, form an excellent and valuable collection; of these the transparent anhydrous table of crystallized nitrate of silver is of great beauty, entitling the exhibitor to a medal, which, however, he declines to receive on account of his status as a juror: his coadjutors fully recognise the merit of this collection of high-class colonial preparations.

In addition to the general exhibits of Messrs. Weaver and Co., of Tasmania, we notice the special attention they have paid to the grass-tree *(Xanthorrhœa Australis)*, from which they show products, consisting of a distilled spirit, picric acid, the resin, and a small sample of a polish made from the latter; also, a sample of wool dyed with the acid, and illustrating its tinctorial properties. We observe the grass-tree resin in all the colonial courts, New Caledonia not excepted, and it appears to us desirable that such an abundant product should be turned to practical account. The dry earthy character of this resin, together with its deep red colour, will in all probability prevent its use as a polish; but it appears to be useful in staining wood, and it might also be found effective for restraining damp from appearing on the walls of rooms. We observe that the spirit from this plant, as here exhibited, is free from unpleasant aroma; Messrs. Weaver and Co. appear to have overcome a practical difficulty pertaining to this manufacture, by effectively removing the resinous and offensive smell which presents itself during the operation: we should have been glad to have learned the particulars and cost of its preparation, but have failed in our endeavours to obtain this detailed information.

The origin of these manufactures from the grass-tree may yet become a point of interest in the history of the industries of the colonies; it may be well, therefore, to state that we are informed that Mr. Patrick Hayes utilized the resin as early as 1857, extracting spirit, pyrogenous and resinoid oils, and colouring matter at that date; and that Mr. Heath, of the department of Inspector of Distilleries for Victoria, extracted spirit from the grass-tree, completing his operations in July, 1864; the latter gentleman has reported as the result of his experiments that 14¾ lbs. of the saccharine extract from the plant has yielded 6-10ths of a proof gallon, or nearly 4¾ gallons per hundredweight. Young trees are preferred; they are denuded of their outer covering, and the inside of the stem is the part used for the extract.

Of chemicals used in photography, Messrs. Priston and Small, of Melbourne, exhibit a very good collection. Amongst those of their own manufacture, may be mentioned plain negative collodion, bromo-iodized collodion, chloride of gold, photographers' varnishes, very good crystallized nitrate of silver, and albumenized paper—a novel colonial industry; also, a very interesting collection of photographic chemicals. Messrs. Flintoff and Deveril, of Ballarat, also exhibit negative collodions, iodized collodion, and photographic dry plates. Judging from the specimens exhibited in illustration of the manufacture of the chemicals and materials for the photographer, this branch of industry is in a healthful and promising condition.

The exhibits in this department also include three Melbourne and one Tasmanian samples of fluid (or, rather, carbonetted solution of) magnesia. These, as well as imported samples of repute, were, for our satisfaction, examined by Mr. J. Cosmo Newbery, chemist to the Geological Survey Department, and the following (which form a part of the results obtained by him) compare the imported samples with those for which a medal and honourable mention have been respectively awarded by us:—

Kruse's	Fluid	Magnesia contains	of Carbonate of	Magnesia	12	grains per ounce.
Weaver's	,,	,,	,,	,,	7·18	,,
Murray's	,,	,,	,,	,,	2·942	,,
Dinneford's	,,	,,	,,	,,	7·7	,,

We cannot conclude our review of the exhibition of Chemical Products without remarking on the imported chemical and pharmaceutical preparations. Among the latter we recognise a choice collection, beautifully and elegantly arranged, and exhibited by Mr. Grimwade, of Russell-street; these would well serve as standards of quality. Messrs. Levy Brothers, of Bourke-street east, show also sundry drugs and chemicals which are well deserving of our notice.

The other exhibits of merit will be found in the List of Awards, and they are not therefore further referred to in this place. Several industries depending on chemical principles (as ink and blacking manufacture), placed in this section, have received full attention and due recognition.

GEORGE FOORD, Chairman and Reporter.

The Jurors of Class I., Section 2, having ascertained the merit of the several exhibitions in this section, have the honour of communicating the decisions at which they have arrived:—

MEDALS.—VICTORIA.

70 Francis, Henry, 31 Bourke-st. East, Melbourne.—For a beautiful sample of Liquor Taraxaci, made from taraxacum of colonial growth, and for various well-made Effervescent, Granular, and other Pharmaceutical Preparations.

71 Gibbons, Sydney.—Collection of Chemicals arranged for Educational Purposes.

75 Hayes, Patrick, Footscray, Melbourne.—For Hydrocarbon Oils, of good quality and of colonial manufacture, on the large scale.

76 Hood and Co., 160 Elizabeth-st., Melbourne.—For colonial-made Soft Soaps, and for the general excellence of their exhibit of colonial-made Chemicals.

79 Kruse, John, Chemist, 96 Russell-st.—For his Fluid Magnesia.

67 Smith, Robert, and Co., Chemical Works, Yarra Bank, Melbourne.—For general excellence of commercial Mineral Acids, Paints, and other Chemical Manufactures.

HONOURABLE MENTION.—VICTORIA.

241 Argnani, A., Dunolly.—For Colonial-made Ink.

69 Flintoff and Deveril, Sturt-st., Ballarat.—For their Photographic Chemicals and Dry Plates for Photography.

113 Macmeikan, James, and Co., Flemington Bone Mills.—For Moulders' Blacking and Coal-Dust for foundry purposes.

82 Priston and Small, 73 Little Collins-st., Melbourne.—For their exhibit of Photographic Chemicals.

85 Wilkinson and Co., 59 Dudley-st., Melbourne.—For Moulders' Coal-Dust and Moulders' Blacking.

325 Wormald, F. G., 21 Madeline-st., Melbourne.—For colonial-made Ink-powders and Ink.

MEDALS.—NEW SOUTH WALES.

30 Elliott Brothers, Pitt-st., Sydney.—For Mineral Acids, of good commercial quality.
11 Graham, John, Sydney.—For Kerosene Oils, of excellent quality.
25 Hartley Kerosene Oil and Paraffin Company (Limited), Sydney.—For Paraffin and Kerosene Oils, of good quality.
232c Salisbury, James, 377 Bourke-st., Sydney.—For fine quality Blackings.

HONOURABLE MENTION.—TASMANIA.

651-664 Weaver and Co., Chemists, Elizabeth-st., Hobart Town.—For Solution of Recarbonetted Magnesia.

WOOL.

Class II.—Section 4.

J. SANDERSON, ESQ., CHAIRMAN.

J. DODGSHUN, ESQ.	W. HARDCASTLE, ESQ.
W. HICK, ESQ.	F. WATTINNE, ESQ.

Referring to the remarks made against each exhibit of Wool from the various colonies, the Jurors cannot but express regret that their labours were so light; as, although some magnificent Wools were shown, there was not from any of the colonies, excepting Victoria, the number of exhibits there might have been, and from South Australia, Queensland, and Western Australia no samples of Wool were sent in.

In the New South Wales Court there were no exhibits from the most celebrated flock-masters of that colony; and, with the exception of one fleece, the same may be said of Tasmanian breeders.

A few very excellent fleeces were shown from the best flocks of the Western District of Victoria, and one or two exhibits of remarkably good Wool from Riverina showed the immense improvement effected in that district during the last few years, where, not very long ago, no good Wool was grown.

JOHN SANDERSON, Chairman.

The following remarks on the Wool-scouring Trade are kindly supplied by Mr. I. G. Reeves, M.P.:—

Wool-scouring Establishments.—The undermentioned persons are engaged in sorting, classing, and scouring Wools for shipment from the port of Melbourne:—F. Row and Co., P. Nettleton, I. G. Reeves, D. Gill, J. H. Turner, D. Hunter. The average amount of wages paid for the six months from September to February is about £1000 per week; the number of men employed, about 500, and 50 boys; from March to August the number employed—men 200, boys 20. The annual value of scoured Wool prepared and shipped from the establishment of the above persons is over £400,000. A portion of this is purchased in grease, scoured, and shipped on their own account; the rest is from the growers, who find it to their advantage to employ the wool-scourers to get up their wool, rather than ship it in the grease. The *employés* on these works, being

mostly married men, are supposed to provide support for 1500 persons in women and children. There are also on the Lower Yarra the wool yards of Mr. Brown and Mr. M'Farlane, who on an average employ from 20 to 25 men each. In the neighbourhood of Geelong, on the Barwon, Messrs. T. Douglass and Co., Bayldon and Graham, and S. Corrigan, have similar works, and employ 30 to 40 men each, and some boys.

The following table shows the Export of Wool from Victoria from 1840 to 1865 inclusive, and may be of interest :—

Year	lbs.	Year	lbs.
1840	941,815	1853	24,328,716
1841	1,578,351	1854	22,951,125
1842	2,893,981	1855	22,237,798
1843	4,695,058	1856	19,970,174
1844	4,492,669	1857	17,176,920
1845	6,237,018	1858	18,748,070
1846	5,809,499	1859	21,056,406
1847	9,994,685	1860	23,123,333
1848	9,930,235	1861	22,811,003
1849	14,541,514	1862	24,332,221
1850	18,548,236	1863	25,112,881
1851	15,798,038	1864	39,032,743
1852	19,745,541	1865	40,527,402

Appendix A.

Messrs. Gooch and Cousens's Wool Circular shows the following Importations of Wool into London, Liverpool, Hull, and other ports, in each of the last four years :—

	1863.	1864.	1865.	1866.
	Bales.	Bales.	Bales.	Bales.
Australasian	241,630	302,177	332,560	348,628
Cape of Good Hope	68,922	69,309	99,991	107,184
East India	64,458	58,909	54,228	79,732
German	31,853	32,684	24,696	40,475
Spanish	1,305	3,419	876	716
Portugal	6,935	8,258	12,685	14,205
Russian	34,693	37,829	37,147	45,021
Sundry	145,530	158,122	123,451	154,497
Total	595,326	670,707	685,634	790,458

Appendix B.

According to the circular of Messrs. Willans, Overbury and Co., of London, the Importations of Wool from Australasia for the year 1866 were as follow :—

Sydney and Queensland	82,271	bales.
Victoria	141,931	,,
Tasmania	16,422	,,
South Australia	40,510	,,
Western Australia	3,565	,,
New Zealand	64,156	,,
Total	348,855	,,

The following is the List of Awards in Section 4 :—

MEDALS.—VICTORIA.

96 Corrigan, S. B.—In excellent condition, superior quality clothing.
99*a* Cumming, John.—Excellent combing, very silky, good condition, and fair quality.
*a*24 Cumming, John.—Excellent in every respect. One fleece of Lamb's Wool very superior in length, quality, and softness.
99*b* Dowling, Thomas.—Excellent combing, very silky, good condition, and fair quality.
*a*26 Dowling, Thomas.—Excellent in every respect.
99*f* Fairbairn, G.—A good specimen of a northern Wool; dry, light, and of a good length.
104 Gill, G. D.—Combing—An excellent exhibit of Scoured Wool. Clothing—A fair sample, well scoured. Lambs'—A splendid sample in every respect.
99*g* Griffiths and Green.—Good combing, well conditioned, medium quality, a good fleece.
99*k* Hogg, H. S.—A very good northern Wool; good in length, condition, and quality; excellent of its class.
99*e* Learmonth, T. and S.—An excellent fleece, but wanting in condition; good length and quality.
99*i* Miller, S. and D.—An excellent northern Wool, of good length and quality.
114 M'Kellar, D.—Very good exhibits of both washed and greasy; well grown, fair quality and fine condition. Very desirable Wool.
99 Ormond, F.—Excellent combing, fine condition and quality.
123 Reeves, I. G.—Lambs'—Good quality, fairly scoured. Fleece—In excellent condition, well scoured. Slipe—Excellent condition, good length and quality. The last two exhibits worthy of a medal.
125 Row, F., and Co.—Slipe; a very useful Wool, in excellent condition, and well got up.
99*j* Russell, P.—Excellent in every respect; good combing and good quality.
99*c* Shaw, Thomas.—Perfect in every respect.
*a*25 Shaw, Thomas.—Excellent in every respect.
99*h* Simpson, R.—A splendid fleece; good combing and quality; excellent in condition, length, and growth.

The exhibits *a*24, *a*25, and *a*26 are all very superior Wools.

HONOURABLE MENTION.—VICTORIA.

99*d* Currie, John.—A good fleece; not bright in colour.
100 Douglas, A., and Co.—In light condition, medium quality, well scoured.
*a*16 Goldsbrough, R., and Co.—Exhibits all in good condition. A good, useful description of Wool.
*a*12 M'Knight and Irving.—Good quality and condition; fair length.
120 Pierce, R. L.—A fair sample, of average quality and condition.
121 Ramage, Alex.—A fair sample, of average quality and condition.
126 Russell, Thos., and Co.—Fair-bred combing, medium condition.

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98 Cuningham and Macredie.—Mere curiosities. Useful Wool, if shorn annually.
109 Lincolne, A.—Small staples shown as samples, some of which are very good. Impossible from such exhibits to express any reliable opinion on the value of the fleeces from which they have been taken.
128 Secretary Shire of Ararat.—A few staples of various lengths. The remarks on 109 apply to this exhibit.

MEDALS.—NEW SOUTH WALES.

38 Hinchcliffe, A.—Excellently scoured, beautiful quality, and very light; good in every respect.
283*a* Kummerer, R.—A very good selection, remarkable especially for its quality and fair condition. The clothing exhibits are the best.

HONOURABLE MENTION.—NEW SOUTH WALES.

284a Bell, Henry.—Very good Scoured Skin Wool, good quality and condition.
34 Ebsworth, F.—Chiefly remarkable for length; medium quality.
286 Ebsworth, F.—A few excellent samples; a varied collection, principally of medium and inferior Wool.
35 Ebsworth, O. B.—Good quality ordinary Scoured Wool.

MEDAL.—TASMANIA.

125 Meredith, John.—An excellent fleece; good condition, length, growth, and quality. Very good combing.

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692 Nichols, H. B.—Single staples of a good style of Wool. The remarks on Victorian exhibit 109 apply to this.
693 Taylor, George.—Single staples of a good style of Wool. The remarks on Victorian exhibit 109 apply to this.

MEDAL.—NEW ZEALAND.

22 Hamilton, R.—A Lincoln Fleece; very bright, good quality, and lustrous. One Leicester Fleece very good; the others are rather loose-haired.

HONOURABLE MENTION.—NEW ZEALAND.

21 Gee, Benjamin.—Good sample of Cross-bred Wool, in good condition. Several samples of two and three years' growth Lambs' Wool, very white and light in condition.
25 Stewart and Brown.—Well scoured and light, medium quality.

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23 Hodgkinson, Dr. G.—Poor samples Cobbed Fleeces.
24 Honeyfield, H.—A few fair staples.

FURS, SILK, AND FEATHERS.

Class II.—Section 4a.

EDWARD TWEDDELL, ESQ., CHAIRMAN.
A. MARTELLI, ESQ. | S. B. PAYNE, ESQ.
M. L. KING, ESQ., M.L.A.

SKINS, FURS, AND FEATHERS.

WITH reference to the exhibits in Skins, Furs, and Feathers, the Jurors, after a careful examination of the whole, have to report that the skins shown are really of comparatively little commercial value as articles of export for the manufacture of Furs, as the skins of Europe and North America are not only of greater beauty, but also lower in price. The Jurors consider that the skin of the Black Opossum might, under the hand of skilful furriers, become of value in the European markets, and would also refer to the possible value and importance of the fur of the Opossum for felting purposes, as the skins of that animal can be procured at a very reasonable price.

The Jurors are also of opinion that the native catskin, if properly dressed, might be extensively available in the manufacture of gloves.

EDWARD TWEDDELL, REPORTER.

Appended is a List of the Awards in this Section :—

SKINS AND FURS.

MEDALS.—VICTORIA.

359 Brearley Brothers, Geelong.—Excellent specimens of dressed Wallaby and Kangaroo Skins.

364 Clark, John, and Sons, Elizabeth-st., Melbourne.—Excellent specimens of dressed Wallaby and Kangaroo Skins.

103 Gardner, F., Collins-street West, Melbourne.—For a superior and choice collection of Manufactured Colonial Furs for ladies' wear, and for the general excellence in preparation and workmanship of the Black, Grey, and Ringtailed Opossum, Catskin, and Emu Rugs.

105 Green, J. R. H., Gertrude-st., Fitzroy.—A good general collection of manufactured Furs. Two novelties in Fur Carriage Foot Mats deserve special notice.

106 Hart, H. H., Collins-st. West, Melbourne, shows an excellent specimen of workmanship in a Lady's Catskin Jacket, and also in a Penguin Table Cover.

HONOURABLE MENTION.—VICTORIA.

473 Central Board Appointed to Watch over the Interests of the Aborigines.—Opossum Rugs, marked for good finish and workmanship.

103 Gardner, Mrs.—An elaborate and interesting Bird-skin Cover.

124a Robertson, J., 87 Lonsdale-street, Melbourne.—Colonial Sheepskin Mats, good dye and finish.

HONOURABLE MENTION.—TASMANIA.

107 Boyd, J., Port Arthur.—For good specimens of Kangaroo and Wallaby Skins, and dressed Opossum Skins.

98 Elliot, G. H.—A good general collection of indigenous Skins of various kinds, and also manufactured Skin Rugs from the Sable, Grey, and Ringtailed opossum.

100 Gould, C.—A good collection of Skins of various kinds, and also manufactured Skins and Rugs.

113 Horne, J. A., Palmerston.—Equally fine specimens of undressed Sable and Opossum Skins.

— Robertson, James, Launceston.—A clever piece of workmanship in a Lady's Jacket, Cuffs, Collar, and Gloves, made by a Scotch lady in crochet work from the fur of the opossum.

FEATHERS.

MEDALS.—VICTORIA..

122 Reed, Mrs. Louisa, Lygon-st., Carlton.—For very good specimens of made-up Albatross, Crane, and Goose Feathers, and for general excellence in colour and finish of cleaned Ostrich Feathers.

124 Robertson, J., Lonsdale-st. East.—For well prepared and beautifully dyed Emu Feathers.

HONOURABLE MENTION.—VICTORIA.

449 Say, W. B., Madeline-st., is the next best exhibitor in curled and dyed Feathers.

HONOURABLE MENTION.—NEW SOUTH WALES.

44 Wilcox, Mrs., Grafton.—Very fine specimen of Swansdown, from the black swan.

SILKS.

We have to report that we have carefully examined the exhibits of Silk in the Exhibition Building; but before proceeding with a detail of the various samples, we would wish to call attention to the following observations on them generally:—

We find that, although great progress has been made in the art of sericulture in this and the neighbouring colonies, much still remains to be learnt by Silk producers in the important operations of selecting and preparing the cocoons for market, and also in winding the Silk therefrom; nearly the whole of the exhibitors having failed to produce Silk of any commercial value, from the absence of proper machinery and skill in carrying out the latter delicate operation.

When we add to this the bad breed of worms in the possession of the colonists and the imperfect means at hand for the breeding of them, practical acquaintance with their habits, and thorough knowledge of feeding the worms, &c., we are surprised that the exhibits should have reached even the standard of excellence which we find, during the short period that has elapsed since this important branch of industrial art has attracted the notice of the colonists of Australia.

With these preliminary observations we offer the following *seriatim* notices of the various samples exhibited:—

MEDAL.—VICTORIA.

117 Pike, Mrs.—This exhibitor, who shows a very large variety, has taken great pains with her various exhibits; and with increased knowledge in the art of winding the Silk from the cocoons, a good breed of worms, and proper attention to their feeding at the right time, with the substitution of the leaves of the white mulberry for the black ones, will be eminently successful in the produce of both raw and manufactured Silk. The Silk is not only brilliant in colour but strong in fibre, and has been prepared for exhibition in a very practical manner. We have no hesitation in recommending this lady for the receipt of the highest honours that the Commissioners have it in their power to bestow for this section of the Exhibition.

HONOURABLE MENTION.—VICTORIA—MELBOURNE DIVISION.

92 Booth, Mrs. J.—This exhibit is brilliant in colour, and is a very fair sample, but the fibre is deficient in strength and unequal in thickness, both defects arising from the causes mentioned in our general observations.

133 Wills, Mrs. J.—This lady also evinces great intelligence in the preparation of her various samples, the White Silk being especially good in colour.

OVENS AND MURRAY DISTRICT.

19, 22. Erroneously described in Catalogue as "Indigenous Silk." This is a species of animal cotton, samples of which were forwarded to England some time ago, and were then pronounced to be of no commercial value.

a Foord, J., Wahgunyah.—Average Merit.

HONOURABLE MENTION.—NEW SOUTH WALES.

43 Wainwright, Miss.—Silk, good in colour, but very little strength in fibre, and thread uneven.

HONOURABLE MENTION.—QUEENSLAND.

*a*4 Timbrell, Mrs.—This lady, who exhibits a great number of cases of cocoons, has already received a premium for her Silk in this colony, but does not show much advance in the art in these samples. This doubtless arises from bad selections of cocoons for breeding purposes at the proper season, with the inevitable result of an inferior class of worm, and corresponding deterioration in the quality of cocoon produced.

MEDALS.—NEW ZEALAND.

28 Yems, Mrs., and Gledhill, Miss.—The Silk exhibited by these ladies is of a good quality, strong in fibre, and fine colour. The samples exhibited by Miss Gledhill are softer in texture, without any diminution in strength, than any in the entire Exhibition.

MEDALS.—TASMANIA.

88, 92 Callow, J.—For Exhibits of Cocoons and manufactured Silk, good in colour, but of delicate and unequal fibre.

94 Gaunt, Mrs.—Average sample, of fair colour.

91 Hinsby, Mrs.—Fair average sample.

89, 93 Johnson, Mrs.—The same remarks apply to this lady's exhibits as to the preceding ones, although much pains have evidently been taken in their preparation.

HONOURABLE MENTION.—TASMANIA.

95 Macarthur, C.—Cocoons good, but breed of worms bad.

The other exhibits in the Victorian division do not call for any special remarks at our hands, being small in quantity and inferior in quality.

The only one of the group of the Australian colonies that has not contributed samples of Silk to this Exhibition is that of South Australia, which is to be deeply regretted, when we take into consideration the very fair display made by several of the younger colonies.

In concluding our report, we would remark that we are of opinion the climate of New Zealand, about Taranaki, from the exhibits sent from that place, appears to us to be specially adapted to the cultivation of Silk.

A. MARTELLI, Reporter.

GUANOS & ARTIFICIAL MANURES, BONES, SOAP, GLUE, TALLOW, STEARINE CANDLES, OILS, HONEY, WAX, SPERMACETI, &c.

Class II.—Section 4 b. and Section 12 c.

PATRICK HAYES, ESQ., CHAIRMAN.

WILLIAM JOHNSON, ESQ.	JOSEPH BOSISTO, ESQ.
J. D. SHERRY, ESQ.	H. BROOKS, ESQ.

R. CHEETHAM, ESQ.

GUANOS AND ARTIFICIAL MANURES.

The subject of Manures has for years engaged the attention of some of the greatest and most practical chemists the world has yet produced; and to the researches of these not only is agriculture indebted in a thousand ways, but the great sanitary question of how to dispose of our sewerage and nightsoil seems in a fair way of being solved. It is impossible to overrate the importance of this question, as much of the future prosperity or otherwise of this country depends upon it. Modern chemistry has shown that in addition to the more bulky ingredients of soils, such as we recognise under the form of sand, clay, lime, humus, &c., there exist in all fertile soils very minute quantities (comparatively) of certain mineral constituents,

which in an ordinary analysis may be overlooked altogether, but which are of vital importance to the well-being of plants. The principal of these are phosphoric acid and potash. Both these substances must exist in sufficient abundance in soils to make them prolific. In short, so important are they that inquiries into the chemical composition of a soil may practically be almost limited into a determination of the quantity of these two constituents. It matters little whether there are a few pounds per cent. more or less of sand or clay in a soil, or any of the other ingredients that are usually abundantly present. Any superabundance of clay is at once recognised by the stiffness it imparts to land. Sand and chalk are perceptible to the eye. Iron is known by the deep intensity of its redness, and humus needs no chemist to estimate its proximate amount. With phosphates and potash the case is very different, as the paucity or abundance of their presence imparts no peculiar feature to the soil whatever, and except by the fertility or barrenness, as the case may be, no indication of their amount is given by the soil. They never exist very abundantly, yet no crop can be obtained if they are absent. Hence it becomes of the first importance to the farmer to become well assured of their sufficiency before sowing the seeds for a future crop, which he looks to as the reward of all his labour and a return for the capital he has invested.

Every crop removed from the surface of a soil more or less, according to its nature, exhausts it of phosphates and potash. Other constituents are also removed, but of these, in consequence of their abundance, no account need be taken. The cereals and tobacco are both very exhausting, and require good, rich, marly soils, or such as have had a volcanic origin, for their continued growth; light soils are soon exhausted. On the other hand, turnips, carrots, potatoes, and allied crops may be grown with advantage, with comparatively little exhaustion of the mineral constituents. The soils of Victoria for the most part are not rich in phosphates. Numerous chemical analyses have been made of them by various chemists of repute from time to time, and from the published results it would seem that they all have arrived at pretty nearly identical conclusions—viz., a great general absence of phosphates and a rather small quantity of lime, the latter being more a mechanical than a chemical deficiency; for though a liberal supply of lime may be required for the disintegration of minerals, but little is required for the sustenance of plants. Potash is more abundant, particularly in the soils derived from bluestone and in granite; there is less likelihood therefore of its exhaustion. Much observation has convinced your Reporter that farmers here should, when purchasing their manures, be more guided by the abundance of phosphates than any other constituent. Not that ammoniacal and other principles are undervalued, but in manuring land care should be taken to administer *most especially* those ingredients of a good soil which the land *has no means of obtaining for itself*. Nitrogen and carbonaceous compounds plants can, with the aid of water, procure in abundance from the atmosphere; but if phosphates once become absent from a soil, there exist no natural means for their restoration. Resource must, therefore, be had in these cases to artificial methods for increasing their quantity.

The great advantage of employing bones as manure, either in the form of bonedust or superphosphate, has been long known, and the benefit accruing is to be referred to the large percentage of phosphoric acid contained. In guano we have another product in which phosphates are also

found, in quantities apparently dependent upon its age and upon certain climatic influences. Thus, in Peru and some of the islands of the Pacific, where rain is not known, guano abounds containing soluble salts and nitrogenised organic compounds which would have been removed in other latitudes where rain is abundant. Hence it is that in islands existing in other parts—some of them in Australasia, where rain is frequent—guano is found from which all the soluble constituents have been removed, very little being in many instances left but insoluble phosphates, mixed with variable proportions of sand, or such other admixture as may be regarded as accidental from the circumstances attending their exposure.

Bearing in mind the great general paucity of phosphates as existing in Victorian soils, guano of this latter class seems peculiarly well adapted. It is portable, and (with the exception of bonedust and superphosphate) contains more phosphoric acid than any other form of manure with which we are acquainted.

Various qualities of guano, however, are to be found offered for sale, each recommended by the vendor for some peculiarity of quality, and having appended the testimonial and analysis of some one or other of the various analytical chemists to be found; but the buyer should not be misled by these oft-times fallacious reports, which (though, doubtless, genuine documents, and truthful, too, so far as the particular article examined was referred to) can scarcely be made to apply to every succeeding shipment of guano that may find its way to these shores. Your Reporter may state that guanos are to be obtained here varying in strength from 20 to 70 per cent., and even more, and of course every degree between. It behoves the farmer, then, desirous of obtaining the full value for his money, to see that when he pays a full price for a good article that he really obtains it; otherwise nothing but disappointment can follow its use. As the eye cannot distinguish between the different values of guano, a rough chemical assay becomes necessary. It will prove economical, then, to employ some person to test the relative value before buying, and pay moderately for its being done.

Bonedust and superphosphate are less liable to differences of quality than guano, hence a farmer is more safe in purchasing them without an analysis. Bones usually contain about 58 per cent. of phosphates; their value as manure can, therefore, be readily understood. As, in addition to phosphates, bones may be expected to contain more than 30 per cent. of cartilage, a substance rich in nitrogen and producing large quantities of ammonia during its decay, it follows that when the phosphates in guano and bones are about equal, that preference must still be awarded to the latter, in consequence of the cartilage contained.

In the Exhibition, various manufacturers of bonedust and superphosphate have contributed samples. Amongst these may be especially mentioned Macmeikan and Co., John Cockbill, J. Collins and Co., Charles Fitts (all in Melbourne), and R. H. Firth (Ovens and Murray district). A farmer wishing to purchase good manure may with great safety apply to any of the above firms for their bonedust or superphosphate, always, of course, comparing their price with that of guanos of known strength and value obtainable elsewhere.

Of imported guanos there are only two exhibitors. Messrs. B. B. Nicholson and Co. show two bags of Malden Island guano, of excellent quality; and J. E. Chapman, of Hobart Town, has sent samples of Bird

Island Guano, said to be largely used as a manure in Tasmania with great advantage. For these honourable mention has been accorded by the jurors.

Turning from imported guanos, we come to an entirely new species of manure, manufactured in the colony from nightsoil and other refuse. Mr. Woodward, who, we believe, was the first to introduce this novel industry, exhibits several samples of manures, so prepared, for some of which he obtained a first-class certificate in the Exhibition of 1861. His *deodorised nightsoil* was found to contain rather more phosphates than any other of the manures prepared from nightsoil exhibited; in other respects, however, there was not much apparent difference between the samples. The other exhibitors were J. Collins and Co., William Laycock and Co., James Macmeikan and Co., the Patent Earth Closet Company, and J. D. Thompson, all of whom may be complimented upon the efficient manner in which all offensive smell has been removed, and the, no doubt, great value of their artificial manures.

Whether these gentlemen will be able to manufacture these manures sufficiently low in price to compete with bonedust or imported guano, and at the same time prove equally valuable, are questions that remain to be solved. They all appear to contain a considerable amount of lime in addition to the phosphates, alkaline salts, and nitrogenised matters of the original nightsoil, and so far they seem to be well suited to the wants of the colony; but before a correct judgment can be formed of their true value it is necessary to perform thorough chemical analyses of them, and then compare them with manures from other sources. It is also to be borne in mind that if these manures are half the price of guano, and only half as rich in phosphates, &c., they would prove infinitely dearer, as the item of carriage of the more bulky article is a most serious one to the farmer.

Of all the artificial manures exhibited, a sample shown by J. C. Lyons, of the Victoria Patent Manure Company, Ballarat, was by far the richest in phosphates, and was awarded a medal by the jury. It was not, however, to be considered as equal to bonedust, superphosphate, or to some imported guanos in the amount of phosphates contained, but contained a large quantity of nitrogenised matter, which, in some measure, compensated the deficiency.

Charles Fitts, Sandridge, exhibits samples of "skutch" manure, or glue refuse. This substance, entirely consisting of animal matter, containing abundance of nitrogen, but only a limited quantity of phosphates, would be found most useful for carrots, turnips, mangold wurtzel, and potatoes, and such other crops as do not exhaust a soil very much of its phosphates. It is also offered at a low price.

To F. R. G. Woodward was awarded the medal for his deodorising compound—a preparation intended to destroy the offensive smells arising from cesspools and water-closets, which it appears to do chiefly by fixing the sulphur so freely disengaged from such receptacles.

WM. JOHNSON, Government Analyst, Reporter.

SOAP.

By the term "Soap," as usually understood, is meant the combination of potash or soda with the common fats. In scientific language this term has been applied to the compounds of fatty acids with basic metallic oxides, which produce soaps of baryta, magnesia, iron, copper, lime, &c.

Except *soap* in the ordinary sense of the term, or the soaps of the alkalies, there are only two of these compounds of technological interest, namely—*lime soap*, used in the manufacture of stearine; and *lead soap*, used in pharmacy, and called *plaister*.

Soap, as we understand it, does not appear to have been known previous to the Christian era, for the soap of the Old Testament seems to have been merely alkali. Profane history previous to Christ does not allude to soap, and in all the detailed descriptions of the bath and of washing it is never mentioned. Pliny describes its manufacture, but says its main purpose was to dye the hair yellow, and that men used it for this purpose more than women. He also declares it to be a Gallic invention, and states that it is best made in Germany. He also distinguishes between hard and soft soaps, and was acquainted with the mode of its preparation from the ashes of the beet and goat's tallow. Galen mentions soap, as do also Paulus Ægineta and Aëtus. Homer describes fully and accurately what Nausicaa took with her for washing at the river, but makes no mention of soap, which was doubtless unknown to him.

Soap appears to have come very gradually into general use, and although a great chemist has said that the consumption of soap by any country may be taken as a means of estimating its civilisation, yet few countries, except England and her colonies, seem to use it as freely as they ought.

Until about 1845 Victoria was supplied with soap from Sydney and England; but such was the expense of transit, loss of weight (amounting sometimes to thirty-five per cent.), the excessively bad quality of the soap exported (anything at that time being thought good enough for the colonies), that these circumstances, combined with the low price of tallow here (1d. to 1½d. per lb.), induced the late James Jackson, owner of Toorak, to commence soap-boiling. He had, as all introducers of new manufactures have, to contend with great difficulties at first, being obliged to use soda crystals as a source for his alkali, and afterwards soda ash. However, he succeeded in making a pure and genuine article, and as this was far superior to the rubbish imported as soap, he met with general support; but it was not until 1862 that imports of English hard soap ceased. For some time these imports had been bought at their actual weights for their colour, to mix with colonial-made soap, instead of palm oil. There is now no soap imported but soft and scented soaps, and as two firms —John Hood and Co. and the Hobson's Bay Soap Company— are now making soft soaps, and several firms are making scented soaps, we may shortly expect to see the importation of soap cease altogether. The manufacture of brown soap—first begun in Melbourne, and afterwards in Geelong—has now been extended to most parts of the colony, the heavy carriage and cheapness of fat leaving a large margin to the local manufacturer. The improvements which have been introduced into the manufacture of soaps by Messrs. Gossage Brothers, of Footscray, in the use of silicate of soda, would seem to point to Melbourne as the great seat of the trade from which other places will eventually draw their supplies. Consumption of soap may be estimated at about half a pound per head per week of the population. Taking that of Victoria at 650,000, this would require about 7500 tons per annum, which, at an average cost of £30 per ton, would amount to £225,000.

The crude materials of the soap-boiler are the fats, as found in the animal and vegetable kingdoms, the most generally used being tallow

hogs' lard, bone grease, horse grease, seal oil and fish oils, palm oil, cocoa-nut oil, palm-nut oil, olive oil, and *resin*.

Soaps are divided into hard and soft, the former being made with soda, and the latter with potash. In the manufacture of hard soap the fats and soda-lye are boiled together in an iron pan by fire or steam. During this process the fatty acids, which in tallow, &c., are combined with a base called glycerine, leave this base to combine with the soda present, and form soap, leaving the glycerine free, which is run off with the spent lyes. The cleansing power of soap depends upon the amount of alkali present, but it is essential that this alkali should be in combination with some weak acid that will only give it up as required in the wash-tub; if in excess, it destroys the clothes. The fatty acids were found to answer admirably for this purpose, no substitute having been discovered until the introduction by Messrs. Gossage and Sons, the well-known soap-makers of Widnes, near Warrington, England, of silicate of soda in the manufacture of their soaps. Silicate of soda was found to be a substance very similar to soap, the alkali being held in weak combination with silicic acid, just as the alkali in soap is held in weak combination with the fatty acids. It was found in practice that, by mixing silicate of soda with soap, the cost price of the soap was diminished by thirty per cent., while the detergent quality of the soap remained unaffected.

Messrs. Tilley and Clack, who exhibit some very beautiful samples of fancy soaps, manufacture their soaps on a principle new to this colony—viz., by the cold process. In this method the caustic lye and fatty matter are mixed together at a temperature much below boiling, and when this is thoroughly done, the mixture is poured into frames and allowed to cool, when it is ready to cut into tablets for stamping. In this process care must be taken that the proportions of fats and lye are carefully estimated, or the soap, if too much lye be used, will be so strong as to injure the skin; on the other hand, if too little lye be present, the soap will be greasy and unpleasant to wash with.

The Hobson's Bay Soap and Candle Company, Messrs. Kitchen and Sons, and others, show pure soaps made from the very best materials, for which prize medals have been awarded them. Messrs. Gossage Brothers, of Footscray Soapery, exhibit samples of the ordinary soaps they supply for domestic use; we find these soaps on examination to combine excellence of quality and cheapness, and consider them in consequence deserving of the highest recommendation.

PATRICK HAYES, Reporter.

GLUE.

Since the last Victorian Exhibition (1861) considerable progress has been made in the production of this most useful article of trade.

All the glues exhibited on the present occasion are of an average superior quality, and with very little difference between them; so good are they that if they can be supplied at a fair price, European glues will cease to be imported.

The samples exhibited by C. Fitts, of Sandridge (370), were beautifully made and of excellent quality, equal to any of European manufacture which comes to this colony.

Messrs. Honneus and Co., of Maldon, showed a sample of pale, thin, and clear glue; a very superior article, carefully manufactured, and of excellent quality.

Messrs. T. Boyd and Leishman, of Wangaratta, exhibited a sample of glue, of good quality, well fitted for ordinary use.

From Sydney we have a sample of glue, of good quality, but not quite clear, exhibited by J. S. Perry and Co.

G. Beissell, of Dunedin, sends from that province an exhibit of excellent quality.

H. BROOKS, REPORTER.

The following extract from the Report of the Jurors at the Great Exhibition of London, in 1862, indicates the points of excellence which should be sought to be obtained in the manufacture of this commodity:—"Good carpenter's or cabinet-maker's glue should be hard, and difficult to break with a hammer, though when broken it should yield suddenly to the force and present a sharp vitreous fracture, although it must be allowed that some very fair glues in thin pieces will yield or bend a little, even when quite dry, before they break. The colour, whether dark or light, should be bright, and not too dark, and without any tinge of green. The substance should be transparent, and free from foreign particles; and the glue should be capable of absorbing a considerable quantity (from four to seven times at least of its weight) of cold water. Generally speaking, the amount of water thus absorbed will serve as indicative of the goodness of the glue, provided that the resultant mass is not too friable, and remains clear, or nearly so; and that when it has been melted, and allowed to cool, the jelly it forms is tolerably clear and firm, and not liable to rapid spontaneous putrefaction."

TALLOW.

Forming as this substance does a very large item of export from Australia, it might naturally be expected to be well represented in the Exhibition. The older of the colonies, New South Wales, has sent several samples of sufficient excellence to entitle them to no less than three medals; for whiteness, texture, and inodorousness some of the samples were most remarkable. Victoria also had several equally good samples. With such excellent materials for the manufacture of candles it is not surprising that the latter should be found prominent amongst the results of our local industry. To the Hobson's Bay Company a medal was awarded for the excellence of their candles, which fully maintained the reputation of this enterprising firm. Excellent candles were also exhibited by W. Murray, of Hobart Town.

STEARINE CANDLES,

Exhibited by Mr. G. W. Praagst, were also regarded as worthy of a medal; and considering the very large sums annually disbursed for the importation of candles of this description, it might be expected that such ought to be profitably and extensively manufactured in Victoria. This, we regret to say, is not the case at present; but it is hoped that the additional experience

acquired by Mr. Praagst will shortly enable him to manufacture them at such moderate cost as will dispense with the necessity of continued importations.

WHALE OILS.

A very interesting collection of sperm, black whale, and black fish oils, also of spermaceti, was shown in the Tasmanian department, O. H. Hedberg and Thomas Johnston being the exhibitors.

WAX AND HONEY

Are both exhibited from all the colonies, and from their abundance and fine quality, combined with facility of obtaining them, may be expected by-and-bye to become large articles of export.

WM. JOHNSON, Reporter.

The Customs Department give the following returns of the Imports of Candles :—

Year.		Year.	
1860	£292,945	1864	£183,360
1861	364,319	1865	101,733
1862	273,934	1866	190,325
1863	239,411		

The following is the List of Awards in Sections 4 b and 12 c:—

MEDALS.—VICTORIA.

370 Fitts, C., Sandridge.—For Glue.
372 Gossage Brothers, Footscray Soapery.—Silicated Soaps, for excellence and cheapness.
69 Hewitt, J. T., Beechworth.—Good serviceable Brown Washing Soap.
367 Hobson's Bay Soap and Candle Company.—White Curd and Mottled Soaps; Tallow Purified and Candle Tallow—for excellence.
377 Honneus and Co., Maldon.—For Glue.
381 Kitchen, J., and Sons, Sandridge.—Yellow Soap, for excellence.
111 Lyons, J. C.—Patent Victorian Guanos.
130 Lyons, John Christian.—Phosphoric Potash Manures, and Nitrogenised Fossil Phosphate Guano.
113 Macmeikan, J., and Co.—For Superphosphate of Lime.
532 Memmot, William, Carlton.—Horns prepared for Combmaking, and for the Manufacture of Combs.
— Peters, Mr., Dunolly.—For Candles.
393 Praagst, Godfrey W.—For Stearine Candles.
398 Tilley and Clack, Victoria Works, South Yarra.—Toilet Soap, for excellence and beauty.
134 Woodward, George.—For Sample of Deodorising Powder.

HONOURABLE MENTION.—VICTORIA.

34 Boyd and Leishman, Wangaratta.—For Glue.
93 Cockbill, J.—For Crushed Bones.
94 Collins, J., and Co.—For Manufactured Manures.
68 Dunn, E. H., Beechworth.—For Beeswax.
370 Fitts, C., Sandridge.—For Neatsfoot Oil.
367 Hobson's Bay Soap and Candle Company.—For FancySoaps and Soap Fruits.
17 Holdsworth, J., Sandhurst.—For Collection of Earthwax, Bottlewax, and other Waxes.
381 Kitchen, J., and Sons, Sandridge.—For Toilet Soap and Soap Fruits; for Tallow Candles.

116 Nicholson, B. B., and Co.—Malden Island Guano.
134 Woodward, George—Deodorised Nightsoil Guano.

MEDALS.—NEW SOUTH WALES.

188 Bell, H., Sydney.—For Tallows, Neatsfoot Oil, and Bonedust.
37 Hewitt, T., Clarence River, Grafton.—For Tallow.
203 York, Chas., Sydney.—For Tallows.

HONOURABLE MENTION.—NEW SOUTH WALES.

192-193 Gregor, John, Woodford Island.—For Beeswax and Honey.
200 Payne, Alderman, Grafton.—For Honey.
189 Perry, J. S., and Co., Sydney.—For Glue.

MEDAL.—SOUTH AUSTRALIA.

29 Tidmarsh, J., and Co., Adelaide.—For excellent Yellow Soap.

MEDALS.—TASMANIA.

507 Murray, W., Hobart Town.—For Candles.
511 Ridley, S., Launceston.—For Brown Soap.

HONOURABLE MENTION.—TASMANIA.

488 Hedberg, O. H., Hobart Town.—Sperm Oil, Black Whale Oil, Black Fish Oil, and Spermaceti.
490 Johnston, Thos., Hobart Town.—For Sperm Oil, Black Whale Oil, Black Fish Oil, and for Spermaceti.
491 M'Arthur, J.—For Spermaceti.
508 M'Laren, J. B., Old Wharf, Hobart Town.—For Candles and Soap.
510 Murray, W., Hobart Town.—For Soap.
493 Scott, Jas., Launceston.—For Honey.
674-512 Wilson, W., Hobart Town.—For Soap and Candles.

MEDAL.—WESTERN AUSTRALIA.

131 Glaskin, F., Perth.—For Brown Soap.

HONOURABLE MENTION.—NEW ZEALAND.

71 Beissel, G., Dunedin.—For Glue.

MEAT, FISH, FOWL—DRIED, SMOKED, OR PRESERVED; ISINGLASS, MILK, BUTTER, CHEESE, GELATINE, &c.

Class II.—Section 5.

A. LINCOLNE, ESQ., CHAIRMAN.

REV. J. J. BLEASDALE,	W. GILLBEE, ESQ., SURGEON.
J. BAKER, ESQ.	M. M'CAW, ESQ.
R. M'DOUGALL, ESQ.	G. NICHOLSON, ESQ.

THE Jurors whom the Commissioners have appointed to decide upon the merits of the respective exhibits in connection with the Intercolonial Exhibition, have now the honour of presenting their report.

The Section which came more immediately under their notice comprised those exhibits usually designated "Preserved Meats," and consisted not

only of hams, bacon, beef, and pork in barrels and rolls, but in that shape which has of late years occupied the attention of scientific and practical men—that of preserving the original flavour and character of animal substances in air-tight tins.

This question of preserving fresh meat cannot be correctly termed a new industry in these colonies, for as early as 1846 prizes were awarded in Sydney, New South Wales, to an enterprising colonist, now a resident in Victoria, for "preserved meat, fish, and vegetables." This gentleman successfully carried out the discovery of Liebig in reference to the peculiar constituents of animal food. The new enterprise failed in those days, partly from the heavy taxes upon the manufacture, in shape of advertising and cost of tins, added to which a large business firm soon after established itself upon the River Hunter, and, being able to import its own tins, completely overwhelmed its smaller competitor. The Jurors had an opportunity of opening a tin of preserved meats manufactured by this gentleman in 1846, and were highly gratified to be able to testify to its perfect sweetness and freshness after twenty years' quietude, and the jurors think it is only justice to this gentleman, the pioneer of this art in the colonies, to mention his name—Mr. Sizar Elliot, now of Melbourne.

The increasing demand for these preserved provisions has resulted very naturally in the establishment of many curing-houses, which have been for years, and are still, employing a large amount of labour and capital, in order to complete the heavy orders which are being regularly forwarded for home and foreign consumption.

The various processes followed for the preservation of meats become invested with peculiar importance. This utilisation of animal products is full of special interest, and although in general the operators have been successful, still in a few instances the original constituents have not remained unchanged.

The jurors examined some tierces of beef from Queensland, which had been treated under the plan recommended by Dr. Morgan—that of injecting brine through sharp-pointed syringes, and forcing it through the arterial system shortly after the death of the animal. The process is represented as rapid, and requiring nothing but simple machinery; the time occupied is said to be only three minutes from the moment the animal is killed until the preservative liquid is injected.

Unfortunately, the beef which came under the jurors' notice was slightly tainted, and the cask of tongues was considered imperfect from the same cause. The jurors do not wish in the least to condemn, or in thus expressing their opinion that it should be considered as condemning, the system introduced by Dr. Morgan, but regret that a more successful proof of this mode of curing had not been forwarded. Some few years since an opinion was prevalent that, from the high temperature of this climate, we were unable to manufacture the articles of commerce under consideration, but this has been proved to be erroneous, for it has been found that when the meat is properly and skilfully treated, a good and perfect cure can be effected during the cool months; for although the temperature is occasionally very high, the air is so pure and light that the anticipated drawbacks have no influence.

The greatest difficulty with the first proprietors of these curing establishments was the scarcity of pigs; but some five years since an impetus was

given by a gentleman, formerly of Limerick, a Mr. John Baker, who entered extensively into the business, and embarked a large capital in a very liberal spirit towards forwarding this new industry. This caused the farmers to turn their attention to the rearing of the raw material, and in a year or two pigs of a good breed became more plentiful, and were looked upon as useful adjuncts to a farm.

To give an idea of the growing importance of this branch of industry, the present monthly consumption of hams and bacon is about eighty tons, which represents a sum amounting to £110,000 per annum. This amount ought to be paid solely to the breeders in the colony, and we have no doubt will be in a year or two.

The above amount merely represents the value of pigs killed for colonial consumption; taking into consideration the labour and expense of the manufacturing process, the latter would bring the amount to nearly £150,000.

It is the opinion of the manfacturers, from whom the jurors have received much useful information, that the colony will soon be able to produce a sufficient number of animals to supply all home demand for these most important articles.

The progress towards practical knowledge must of course be necessarily slow in a young colony, and the successful introduction of any new industry ought always to be hailed with pleasure. The jurors, on adjudicating in this section, testify with much willingness to the superior imitation of the much-valued Italian sausages exhibited by Mr. Lewis Pensins, and manufactured at Dunedin, New Zealand; they are rich in quality, and equal in every respect to the article they represent.

The hams and bacon exhibits varied very much in their respective characters, for while some had the undoubted stamp of superiority upon them others were far beneath mediocrity. This branch of colonial industry is rapidly extending, and upwards of ten tons are weekly made during the curing season. The jurors are of opinion that those exhibits to which they awarded "excellence of quality" were not only cured better, but had had the advantage of good feeding during life, and it is their unanimous opinion that success cannot be certain on the part of the curer if the animal slaughtered has not been carefully fed upon suitable corn-feed prior to being killed.

The hams, bacon, and lard exhibited by Messrs. M. A. Munn and Co., 27 King-street, were very superior in every way. The two barrels of pork were also considered excellent; one of these barrels was made from the "silver wattle" wood staves, which imparted neither stain to the meat nor colour to the brine. The exhibitors of this mess pork informed the Jurors that they are in a position to supply shipping with this article in any quantity, and at English prices. The wholesale price of their bacon is 1s. 3d.; hams, 1s. 4d.; and lard, 1s. 4d. per pound.

The beef-hams, catalogued in the name of J. T. Smith, 89 Queen-street, Melbourne, were noticeable not only for good quality of meat and their great weight—eighty pounds each, but from the fact that they were from animals fed on the banks of Cooper's Creek, and in close proximity to the spot upon which the lamented explorers, Burke and Wills, met their deaths from starvation in 1863. The hams are well cured, and present a very marketable appearance. Mr. William Smith, 100 Victoria-street, Melbourne, added greatly to the number of exhibits in this department, and the

majority of them are most excellent in quality; the rolled bacon and middles met with high approbation as being well salted, and evidently from superior animals; the hams also were good. The same exhibitor, in connection with Mr. Clark, has on view a great variety of preserved meats in tins, and after opening and inspecting several samples, the Jurors considered them excellent in quality, and very creditable productions.

A very large display of provisions of like character to the above is made by Messrs. Watson and Patterson, Northcote, and Bourke-street west; their hams especially were considered well worthy of the highest award. The major part also of the rolls of bacon and sides were sweet, sound, and very good in quality.

Sandhurst in Victoria was represented by Mr. John Taylor, Epsom, and his hams were considered "excellent in quality;" his bacon also receives commendation of a second character, as it was wanting only in appearance, not having been so artistically cut as is desirable.

New South Wales has forwarded through her enterprising representatives many superior samples of preserved meats; those exhibited by Mr. J. J. Leslie, Camperdown, and by the Australian Meat Company, Clarence River, are especially worthy of recommendation, as is also the exhibit in shape of concentrated essence of beef, entered in the name of Mr. H. M. Whitehead, of Mossman's Bay. This boon to all inland travellers deserves especial notice; one pound of this substance represents four gallons of nutritious soup; it requires no mastication, is easy of digestion, and so portable withal, it is admirably adapted, while on a journey, for mixing with any farinaceous food in a variety of ways.

Messrs. R. and W. Russell, Liverpool-street, Hobart Town, exhibit some hams of very good quality, well cured and spiced. Mr. R. M'Cracken has to his credit some excellent samples of preserved meats in tins, bearing date of years 1861 and 1862, in various sized tins; one interesting fact connected with some few of the samples is that they have undergone the severe test of two whaling voyages of no inconsiderable length, and when opened represented some very superior exhibits of provisions. In a letter received recently from Mr. M'Cracken, the Jurors are informed that the 6-lb. tins can be sold by him at 6½d. per lb., but for a large order at a price rather less. The 2-lb. tins are quoted at 7½d. per lb. With the notice of a week or ten days, Mr. M'Cracken is prepared to deliver from two to three tons per month. Mr. Adcock, also of Hobart Town, exhibits spiced beef of very superior quality. The prices he has forwarded to the Commissioners at which he could supply a ton at a month's notice is £60, or a trifle over 6¼d. per lb.

Various preparations of kangaroo-meat were forwarded by Mrs. Crouch, Tasmania, but although these exhibits were not disagreeable to the smell, a further test after being cooked would be necessary before pronouncing an opinion upon them.

Of dairy produce, the Jurors are unable to find any imported article in the shape of cheese of a high character. The production from Warrnambool entered by Mr. J. Orlebar, the gentleman who has taken successively the last two years the high prizes in money and silver cup, still maintains its pre-eminence, and is, in the opinion of the Jurors, equal in excellence to any colonial cheese they have ever had the pleasure of tasting.

ABRAHAM LINCOLNE, Chairman and Reporter.

The following is the List of Awards in Section 5 of Class II.:—

MEDALS.—VICTORIA.

23 Connesbie, J., Beechworth.—Hams and Bacon.
a53 Elliott, Sizar, Melbourne.—Preserved Meat, twenty years old.
137 Munn, M. A., and Co., 27 King-st.—Bacon and Hams.
194 Orlebar, John, Warrnambool.—Cheese.
141 Smith and Clark, 100 Victoria-st.—Preserved Meats.
141 Smith, W., 100 Victoria-st.—Rolled Bacon and Middles.
140 Smith, J. T., 89 Queen-st.—For Rolled Bacon and Beef Hams.
15 Taylor, John, Sandhurst.—Hams.
144 Watson and Patterson, Bourke-st. West.—Hams.

HONOURABLE MENTION.—VICTORIA.

135 Croppa and Borsa, Daylesford.—Italian Sausages.
137 Munn, M. A., and Co., 27 King-st.—Mess Pork and Lard.
138 Pensins, L., Brunswick—Italian Sausages.
140 Smith, J. T., 89 Queen-st.—Beef Hams.
141 Smith, W., 100 Victoria-st.—Hams.
15 Taylor, John, Sandhurst.—Bacon.
142 Taylor, Thomas, 33 Swanston-st.—Bacon.

MEDALS.—NEW SOUTH WALES.

47 Australian Meat Company, Clarence River.—Preserved Meats.
40 Leslie, J. J., Sydney.—Preserved Meats.
51 Whitehead, H. M., Sydney.—Essence of Beef.

HONOURABLE MENTION.—NEW SOUTH WALES.

49 Loder, Geo. T., Hunter's River—Ham and Bacon.

MEDALS.—TASMANIA.

134 Adcock, G., Hobart Town.—Spiced Beef.
133 M'Cracken, R., Hobart Town.—Preserved Meats.
142 Murray and Murdoch, Hobart Town.—Cheese.

HONOURABLE MENTION.—TASMANIA.

136-141 Crouch, Mrs.—Kangaroo Meats, various.
135 Russell, R. & W., Hobart Town.—Hams, spiced, and Cheese.

NATURAL HISTORY.

Class II.—Section 6.

PROFESSOR M'COY, CHAIRMAN.
DR. THOMAS BLACK | T. S. DOBSON, ESQ.
A. R. C. SELWYN, ESQ.

The Natural History collections belonging to the animal kingdom were, with few exceptions, very inferior in extent, variety, or interest to what might have been expected. By far the most instructive and complete local collection of mammalia and birds was that exhibited by Messrs.

M'Gillivray and Wilcox, from the Clarence River district; this furnished beautifully prepared skins of nearly all the known warm-blooded animals of the locality, besides a great number of most interesting insects and osteological preparations.

The collections of Invertebrata, exhibited by Mr. and Mrs. Pain, were the most extensive series of shells and insects exhibited; but they were not illustrative of one district, but rather a miscellaneous collection from many different localities. Mrs. Pain's collection of Australian birds' eggs was the only one exhibited of any extent; and although the number of species was not very large, still the specimens were good and well mounted.

Of the interest attaching to a single specimen exhibited by Mr. Morton Allport it would be impossible to speak too highly. This is a two-year-old salmon, about ten inches in length, which had been hatched from ova brought in ice from England, by the Acclimatisation Society of Melbourne, acting in concert with the Salmon Commissioners of Tasmania, and mainly at the expense of the Government of Victoria. As the marks of the parr had quite disappeared, and the bright silvery dress of the migratory salmon had been assumed, this was the first proof of the complete success of the joint Victorian and Tasmanian experiments for acclimatising the salmon in our Australian waters, and bringing the genus, at present restricted, for the first time into the Southern hemisphere.

Two small collections from West Australia were of great value, from the number of rare species contained in them; the one of insects and birds, many of the former of great interest and rarity, exhibited by the Rev. G. Bostock; and the other, a very interesting local collection of shells, corals, and sponges, from near Perth, exhibited by Mr. Shenton, in which many rare species seemed to be common.

The only other collection requiring special notice is the case of Australian Polyzoa, collected and mounted by the exhibitor, Mr. Watts, who obtained nearly one hundred species exhibited, at Warrnambool.

The specimen of the "baleen," or whalebone, of the New Victorian Whalebone Whale (*Physalus Grayi*, M'Coy), exhibited by Professor M'Coy, is interesting as the first sample exhibited of the colonial whalebone fit for making brushes, such as are at present largely imported. The whale from which it was taken was a "Finner," about 90 feet in length, and yielded several tons of oil and walebone or baleen.

FREDERICK M'COY, CHAIRMAN.

The following is the List of Awards in this Section :—

MEDALS.—MELBOURNE.

148 Gaskell, Joseph.—Specimens of Natural History.
155 John, St. J., Ballarat.—Two cases Native Birds.
89 National Museum.—Two cases Stuffed Animals—Angora Goats, Alpacas, and Llamas—imported by the Acclimatisation Society.
118-190 Pain, Mrs. H. E.—Australian Birds' Eggs, Ferns, and Seaweed.
154 Pain, H. E.—Large and varied Collection of Insects, Crustacea, Land Shells, Marine Shells, and Corals.

Professor M'Coy.*—Baleen of New Whalebone Whale of Victorian seas, fitted for manufacture of brushes, &c.
874 Wood, Wm., Fitzroy.—Stuffed Birds and Quadrupeds, &c.

HONOURABLE MENTION.—MELBOURNE.

18 Court, Henry.—Fossil Shells.
75 Watts, Henry.—Marine Polyzoa.

HONOURABLE MENTION.—SANDHURST COURT.

69 Slocombe, John.—Two cases of Stuffed Australian Birds, obtained and stuffed by him near Sandhurst.

MEDAL.—BEECHWORTH COURT.

24 Dunn, Edward John.—Reptiles, Fish, and Insects.

HONOURABLE MENTION.—BEECHWORTH COURT.

25 Eustace, Albert William.—Opossum and Case.
26 Ramsay, Peter D.—Case of Ovens Birds.
27 Rutherglen Borough Council.—Pelican.

MEDAL.—NEW SOUTH WALES.

46 Wilcox, J. F., and M'Gillivray, J.—Large Collection of Specimens of Natural History.

MEDAL.—TASMANIAN COURT.

736 Allport, Morton.—Salmon, two-year-old Smolt, and Perch, from imported ova.

HONOURABLE MENTION.—TASMANIAN COURT.

208 Fereday, Mrs., George Town.—Portfolio of Algæ and Hydrozoa of Tasmania.
97 Hissey, W.—Collection Tasmanian Birds.
127, 128 Horne, A. J.—Buck's Head and Antlers.
122, 123, 96 Notman, W.—Native Hyena, Iguana, and Stuffed Tasmanian Birds.
209 Whitefoord, Messrs., Launceston.—Portfolio of Algæ and Hydrozoa of Tasmania.
24 Wintle, S. H.—Fossils.

MEDAL.—WESTERN AUSTRALIA.

185–189 Bostock, Rev. G. J.—Specimens of Natural History, including Insects.
190 Shenton, A.—Collection of Shells, Corals, and Sponges.

HONOURABLE MENTION.—NEW ZEALAND.

68 Stewart, W.—Four Frames of Ferns.

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* Medal declined, as one of the jurors.

TEA, COFFEE, SPICES, GINGER, HOPS, HERBS AND AROMATIC PLANTS, STARCH, GLUTEN, SAGO, TAPIOCA, SUGAR, AND CONFECTIONERY.

Class III.—Section 7 a.

DR. EADES, CHAIRMAN.

J. BENN, ESQ.
HON. A. FRASER, M.L.C.
J. COCKBURN, ESQ.
W. D. GILLBEE, ESQ., SURGEON.
GERMAIN NICHOLSON, ESQ.

In this important class the Jurors desire to congratulate the public of the Australian Colonies on the manifest improvement made in the cultivation of plants of a useful and economic character, and in the collection of manufactured articles. They also wish to express their high appreciation of the many excellent exhibits from the Mauritius, Batavia, and New Caledonia.

VICTORIA.

The colonists at large may be well pleased with the steady onward progress made since the Exhibition of 1861-62 in every branch of Victorian produce submitted to examination at this Exhibition. We are now plentifully supplied with the ordinary comforts of life, and with very many of its luxuries, as for example:—

CONFECTIONERY.

Of this manufacture, so alluring to those who delight in the sweets of life, there were many very good specimens besides those which obtained medals and honourable mention. The large assortment of confectionery manufactured by Messrs. Dillon and Burrows, Latrobe-street west, consisted of goods of excellent quality and manufacture; they were bright, clear, and pure, equal if not superior to any imported. The preserved crystalline fruits, chocolate, cocoa, and French confectionery made by Messrs. Giraud andCo., Bourke-street, were all excellent, particularly so the crystalline; the entire equal to any English goods of the kind.

Those of the community who choose to please the eye and palate too, can perfectly gratify both by enjoying the fancy ornamental confectionery made by Mr. Joseph Greenslade, of Elizabeth-street; this well-made and beautiful set of specimens shows great artistic skill. Ballarat is beginning to vie with Melbourne in this tasteful art. An assortment manufactured by Mr. John Taylor, Dana-street, Ballarat, was pronounced to be well made, very good, and of choice flavour. The consumers of these delicacies may indeed be congratulated upon the widely-spread opportunities they have of thus gratifying their taste.

BISCUITS AND BREAD.

Biscuits.—It was with no ordinary pleasure the Jurors examined the samples of this nutritious and useful article of produce, whether con-

sidered as a necessary one of life for the distant traveller, the wandering explorer, or as a refined delicacy of social life. A large assortment of machine, fancy, and dessert biscuits, of excellenct quality and neatness of workmanship, was forwarded by Messrs. Smith and Son, Gore-street, Fitzroy. The extensive variety of biscuits suitable for all purposes and climates, all stages of life and constitution, gave a pleasing proof of what Messrs. Swallow and Ariell, of Sandridge, have done, and continue to do, towards supplying the increasing demands of civilised life of the present day.

BREAD.—The Aërated Bread Company furnished from time to time, during the period in which the Exhibition was open, various samples of their ordinary and fancy bread, made after the method of Dr. Dauglish. It can be highly recommended as a well-made, good, and wholesome bread.

MISCELLANEOUS ARTICLES.

To avoid entering into exhausting detail, the Jurors can with much satisfaction state that the rich-flavoured white and crushed lump sugar of the Victorian Company, Sandridge; the piquant spices and fragrant coffee of Messrs. Bracher and Parsons, M'Kenzie and Co., and of R. Harper and Co.; the granulated preserved potatoes (so valuable for long voyages) of Mr. Symington, Bacchus Marsh; to the minor but equally excellent samples of maizena and starch forwarded by Messrs. Urie, Young and Co., and by M. Munn and Co.; and the delicious currie powder of R. Lavers—all give ample proof of the good results of honourable emulation, and enable the colonists to adopt with confidence the motto of Victoria, "*Vires eundo acquirit.*"

NEW SOUTH WALES.

ARROWROOT.—The high perfection to which this article has been brought enabled the Jurors with full confidence to place it among the best specimens imported to England. Hitherto, the arrowroot brought into the English market was cultivated and prepared in the East and West Indies, Ceylon, and Sierra Leone. The West Indian arrowroot, particularly that from the Hopewell Estate, St. Vincent, and from Bermuda, was held in the highest estimation. We now can add to the list Australian arrowroot, which, if the exhibitors continue to cultivate and prepare with the same care as the samples forwarded to this Intercolonial Exhibition, will vie with the best West Indian. The samples of arrowroot caused much and prolonged inquiry to the Jurors to enable them to be satisfied with the judgment they should give. Experiments, however, performed by a lady of much experience (wife of one of the Jurors) settled the question, when the first prize was awarded to Messrs. Cole and Son, Tomago, Hunter River; while the arrowroot of Mr. W. C. Hetherington, Melville, West Maitland, and of Mr. John Higgins, Berrice, Gloucester, were pronounced as nearly equal to it. Under the lens they all presented the appearance of the best West Indian. Honourable mention was awarded to Mr. Loder, Singleton, for his sample of arrowroot, as being good and nutritious. An arrowroot called "Canna," of which Mr. William Taylor, Grafton, was the exhibitor, deserves notice for its goodness of quality, the more so if made from the Canna Edulis. The jurors regret that no description was given of the plant from which

this specimen was prepared. It somewhat resembled a preparation called *Tous les mois*, made in St. Kitts, which makes a non-irritating, easily-digested article of food, suitable for children and invalids.

SUGAR.—Those of the Jurors who were by experience and long observation able to form a sound opinion, carefully investigated this staple article of commerce. They were much gratified with that produced by the Rev. J. Holland, Port Macquarie; to use their words—"This fine sample of light brown sugar was very similar to muscovado, and would make a very useful grocer's sugar." The other sugars, all possessing varying degrees of goodness of quality, were examined with much interest, as illustrating what can be done in New South Wales in this important branch of mercantile enterprise. The samples of sugar-cane forwarded by Mr. John Gregor, of Woodford Island, were very large specimens of good plants.

CAYENNE PEPPER.—Of the samples of Cayenne pepper, four only were examined, the remainder could not be found. These were all pure, good, and of fine quality, particularly so that of Mrs. Bunker, Liverpool, N.S.W., to which the specimen of Mr. J. K. Osborne, West Maitland, was nearly equal.

STARCH.—Mr. Charles Moore, Director of the Botanic Gardens, Sydney, forwarded, with many other useful preparations, a sample of starch, which was considered by the Jurors as an interesting production, being prepared from the *Castanospermum Australe;* hence it was considered as illustrative. The Jurors had no opportunity of testing its quality as compared with wheaten starch, therefore they hesitate to pronounce an opinion on its mercantile value.

SAMPLES OF DRIED HERBS FOR CULINARY PURPOSES.—These agreeable preparations, which add not a little to the "creature comforts" of civilised life, by enabling us to enjoy in winter the delicate and fresh productions of summer, were admirably displayed in the choice collection forwarded by Mr. Lackersteen, George-street, Sydney. The samples were marjoram, thyme, sage, parsley, mixed herbs, and celery seeds. It should be borne in mind that such preparations are not to be considered merely in their character of gratifying the palate; in weak conditions of the stomach, and in the capriciousness of appetite which accompanies debilitated states of the system, they are medicinal.

QUEENSLAND.

To this Class and Section not many articles were furnished by Queensland. The Cayenne pepper of Mr. C. F. Chubb, Ipswich, was found to be of good quality, well ground, and in a very marketable state.

LEAVES (MEDICAL).—Mr. Thozet, Rockhampton, who is evidently an indefatigable labourer in preparations of this kind, and others of an analogous character, forwarded several interesting preparations, among them the leaves of *Gastrolobium grandiflorum.* The Jurors have not had as yet an opportunity of testing the medical properties of the latter, but they feel bound to express their decided approbation of the collection.

SOUTH AUSTRALIA.

BISCUITS.—The specimens of biscuits which were furnished by Mr. J. Lavin, Port Adelaide, were for some time overlooked, the chest which contained them being broken. When attention was called to them they were

found to be well prepared, made of the best flour, and deserving of honourable mention.

TASMANIA.

HOPS.—This beautiful sister colony of ours, by furnishing many useful and interesting specimens, proves her appreciation of the great advantages of Intercolonial and International Exhibitions to all classes of society. Among the specimens was a sample of hops of rare quality, cultivated in Valleyfield, by Mr. E. Shoobridge, New Norfolk. These hops were well picked, and contained a fair average quantity of the proximate principles of the best Kent hops. The value of adding to our colonial resources a plant of such commercial importance cannot be overestimated.

CURRY POWDER.—Samples of curry powder were forwarded by Mr. Keene, of Kingston, Brown's River. This preparation is a superior article, of excellent flavour, and not too pungent, and is entitled to receive a medal.

NEW ZEALAND.

HOPS.—The samples of hops cultivated by Messrs. Bailey and Sons, Raglan Brewery, Nelson, and by Messrs. Hooper, Dodson, and Aitken, Nelson, were the subject of frequent and careful examination by the Jurors, and gave no small difficulty in determining their comparative excellencies with each other, and with the Tasmanian hops. All alike were fresh, odorous, and aromatic, but the Tasmanian were better picked.

LEAVES AND BARK.—Mr. Thomas Kelly exhibited nine specimens of native woods, in the form of books containing leaves and bark. The jurors regarded this mode of exhibiting specimens to be highly useful and instructive.

NEW CALEDONIA.

With rapid strides this young colony is advancing in the development of those products which civilisation, aided by scientific men, can effect. The specimens of agricultural, horticultural, and indigenous vegetable products were much admired by the Jurors, and claimed their unanimous congratulations to their French neighbours for the varied and valuable collection forwarded to the Intercolonial Exhibition.

SUGAR.—The sample of this article made by Monsieur Joubert, Noumea, was pronounced as deserving of special notice. Its quality was good, and very similar to a good description of Manilla sugar.

COFFEE.—Monsieur Boutan, Director of the Model Farm, furnished a sample of coffee in husk and dressed. The berry was of a nice green colour, and of superior quality. Special notice was also called to it and to the coffee.

GINGER.—The green ginger also furnished by Monsieur Boutan was very good and well flavoured.

GLUTEN.—The samples of gluten from the manioc in the root, and in three stages of its preparation, forwarded by Monsieur Pancher, Government Botanist, were good illustrations, and also the gluten obtained from the pix *(Tacca pinnatifida)*, by Dr. Vieillard, Imperial navy. In addition to these samples, which are placed in this Class and Section, Monsieur Pancher and Dr. Vieillard furnished many useful exhibits,

proving their zeal and industry in advancing the interests of these national intercommunications. Of the variety of specimens forwarded by Monsieur Bavay, chemist, Imperial Navy, those of the *Amoricum scylanicum* were very good.

NETHERLANDS-INDIA.

This old colony is regaining its former character for the excellence of its products.

COFFEE.—The Netherlands-India Trading Society furnishes samples of coffee, the berries of which were good, clean, and well flavoured. Messrs. Fanning, Nankivell and Co.'s samples of Java-produced coffee, and samples of the same forwarded by Messrs. Morgan, Melbourne and Co., were all about equally good, possessing a delicate aromatic flavour.

SPICES.—The cloves of the Trading Society, the white nutmegs of Messrs. Fanning, Nankivell and Co., and the brown nutmegs, mace, and cloves of Messrs. Morgan, Melbourne and Co., were all of first-rate quality, receiving the highest commendation of those who examined them.

The following is the List of Awards in this Section :—

CONFECTIONERY AND BISCUITS.

MEDALS.—VICTORIA.

225 Dillon and Burrows, Latrobe-st. West, Melbourne.—Colonial-manufactured Confectionery. Brightness, clearness, and purity.
228 Giraud and Co., Bourke-st.—Chocolate, Cocoa, and French Confectionery. Excellence of quality and delicacy of taste.
230 Greenslade, Joseph, Elizabeth-st.—Fancy Ornamental Confectionery. Great artistic skill.
207 Smith and Son, Gore-st., Fitzroy.—Machine Fancy and Dessert Biscuit. Excellence of quality.
234 Swallow and Ariell, Sandridge.—Ship, Fancy, and Dessert Biscuit. Excellence of manufacture and quality.

HONOURABLE MENTION.—VICTORIA.

220 Ærated Bread Company.—Very good, wholesome, and pure Bread.
211 Stickland, James, 50 Gertrude-st., Fitzroy.—Fancy Biscuits, of very fair quality and flavour.
236 Taylor, John, Dana-st., Ballarat.—Confectionery. A very good assortment, and well made.

HONOURABLE MENTION.—SOUTH AUSTRALIA.

25 Lavin, John.—Biscuits.

MAIZENA, COFFEE, SPICES, SUGAR, &c.

MEDALS.—VICTORIA.

162 Bates, Charles.—Colonial-manufactured Cocoa, of very superior quality and good flavour.
265 Felton, Alfred.—Light Laundry Blue. Superior quality.
179 Harper, Robert, and Co., 57 Flinders-lane East, Melbourne.—Coffee and Spices. All good ; of excellent quality.
186 Lavers, Robert, opposite Public Library, Melbourne.—Currie Powder. Well got up ; excellent quality.
80 Levy Brothers.—Baking Powder. Excellent.

189 M'Kenzie, James F., and Co., 3 Queen-st., Melbourne.—Coffee and Spices. All good; of excellent quality.
189 M'Kenzie, James F., and Co., 3 Queen-st., Melbourne.—Pearl Barley, Oatmeal, and Chicory. For their nutritious properties.
232 Munn, Matthew A., and Co., 27 King-st., Melbourne.—Maizena and Starch. Goodness of appearance, and quality as food.
235 Symington, William, Bacchus Marsh.—Granulated (Preserved) Potatoes. A very valuable article for long voyages.
311 Victoria Sugar Company, Sandridge.—Refined Sugar, its quality being equal to good foreign sugars.

HONOURABLE MENTION.—VICTORIA.

168 Bracher and Parsons, 68 Elizabeth-st., Melbourne.—Coffee and Spices. The coffee and spices were exceedingly good.
170 Capp, R. S., Geelong.—Arrowroot.
224 Dannielli, Sebastian, Sydney-road, Brunswick.—Macaroni and Vermicelli. As a good specimen of a new industry.
— Ewing, Thomas A.—Yeast Powder.
215 Urie, Young and Co.—Patent Refined Maizena. Goodness of preparation.
216 Urie, Young and Co.—Starch, White and Blue. Good quality.
216 Urie, Young and Co.—Australian Washing Powder; good quality.
311 Victoria Sugar Company.—Treacle. Very good.
238 Vieusseux, D., and Co., Emerald Hill.—Cocoa and Chocolate. Delicacy of flavour.
219 Wilson, S., Wimmera.—Arrowroot. On trial found to be very good.

HOPS, PLANTS, AROMATIC HERBS, &c.

HONOURABLE MENTION.—VICTORIA.

169 Candy, William, 204 Bourke-st. East.—Medicinal Herbs and Roots. A good collection; well prepared.
192 Mueller, Dr. Ferdinand, Chevalier de la Legion d'Honneur, Government Botanist.—Victorian Sassafras (Ætherosperma Moshatum). A very good sample.
192 Mueller, Dr. Ferdinand.—Hops. Illustrative and interesting. Collection of Medicinal Herbs (twenty specimens). Goodness of preparation.

MEDAL.—NEW SOUTH WALES.

89 Lackersteen, A. A., 292 George-st., Sydney.—Samples of Dried Herbs. for culinary purposes.

HONOURABLE MENTION.—NEW SOUTH WALES.

69 Clark, Mr., Grafton, Clarence River.—Sarsaparilla (Glyciphyllum smilax).

MEDAL.—TASMANIA.

146 Shoobridge, E., New Norfolk.—Hops. A most excellent specimen; well picked.

HONOURABLE MENTION.—TASMANIA.

254 Boyd, J., Port Arthur.—Sassafras Bark. Good, and very aromatic.
265 Boyd, J., Port Arthur.—Called Native Pepper. It is an agreeable aromatic.

MEDALS.—QUEENSLAND.

9 Chubb, C. F., Ipswich.—Cayenne, of good quality and well ground.
19 Thozet, O., Rockhampton.—Ten specimens of Bark; five specimens of Leaves. Carefulness of collection and preservation.

HONOURABLE MENTION.—QUEENSLAND.

21 Thozet, A.—Leaves of the Gastrolobium Grandiflorum. Goodness of preparation.

HONOURABLE MENTION.—NEW CALEDONIA.

14 Hoff and Marie.—Stem and Leaves of Ignili *(Desmodium)*, a good specimen.

22 Maristes, Rev. Father, Noumea.—Manioc. A good and well-prepared specimen.

20 Pancher, Mons., Government Botanist, Noumea.—Manioc, dried. Well prepared.

MISCELLANEOUS.

MEDALS.—NETHERLANDS-INDIA.

— Morgan, Melbourne and Co., Batavia.—Mace and Cloves. Both of excellent quality.

— Morgan, Melbourne and Co.—White Nutmegs, Coffee. Very good; nutmegs excellent; both excellent.

— Netherlands-India Trading Society.—Twelve boxes Teas. All good specimens; No. 1, superior excellence, of flowery Pekoe flavour.

— Netherlands-India Trading Society.—Cloves. Excellence of quality and high flavour.

HONOURABLE MENTION.—NETHERLANDS-INDIA.

— Morgan, Melbourne and Co.—Samples of Java Coffee. Very good Berry.

— Morgan, Melbourne and Co.—Nutmegs. Excellent; deserving of notice.

— Netherlands-India Trading Society.—Coffee. Excellence of quality.

— Netherlands-India Trading Society.—Dressed Rice. Good quality.

— Netherlands-India Trading Society.—White Crystalline Sugar.

MEDALS.—NEW ZEALAND.

42 Harley and Sons, Raglan Brewery, Nelson.—Hops. Great excellence of quality.

43 Hooper, Dodson and Aitken, Nelson.—Hops. Great excellence of quality.

44 Kelly, Thomas.—Nine specimens of native Woods, in the form of books, containing leaves and bark. A most useful and instructive collection.

SPICES, SUGARS, ARROWROOT, &c.

MEDALS.—NEW SOUTH WALES.

66 Bunker, Mrs., Liverpool, N.S.W.—Cayenne Pepper. Pureness and good quality; an excellent sample.

123 Cole, W., and Son, Tomago, Hunter River.—Arrowroot. One of the best samples, after experiment.

129 Hetherington, W. C., Melville, West Maitland.—Arrowroot. Pure and white.

131 Higgins, John, Berrico.—Arrowroot, pure and white.

132 Holland, Rev. J., Port Macquarie.—Sugar. Strong and clean; flavour very similar to Muscovado.

HONOURABLE MENTION.—NEW SOUTH WALES.

79 Fisher, T.—Canna Arrowroot. As a good illustrative sample.

125 Gregor, John, Woodford Island, Clarence River.—Sugar Cane. Large specimens of good plants.

80 Lackersteen, A. A.—Cayenne Pepper. Well ground and well got up.

133 Loder, George Thomas, Singleton, Hunter River.—Arrowroot. Nutritious quality.

152 Macarthur, J. and W., Camden.—Cayenne Pepper. Quality very good.
134 Mackie, Rev. George, Kiama, 100 miles south of Sydney.—Sugar. As a good illustrative sample.
135 Miller, T. H., West Maitland, Hunter River.—Sugar, shown in its various stages of desiccation. Interesting and illustrative; goodness of flavour.
138 Moore, Charles, Director of the Botanic Gardens, Sydney.—Starch, made from the Castanospermum Australe. An excellent specimen, illustrating what may be obtained from this plant.
140 Nowlan, J. R., Eelah, West Maitland.—Sugar, from Imphee. Illustrative, and goodness of flavour.
103 Osborne, T. K.—Cayenne Pepper. For its pure and good flavour.
144 Scott, Thomas, Brisbane Water.—Sugar. A very sweet and clean flavour.
145 Scott, Walter, Hunter River.—Sugar. Goodness of grain, and fair flavour.
149 Taylor, W., Clarence River.—Canna Arrowroot. Goodness of quality.
112 Travers, Mr., Grafton, Clarence River.—Canna Arrowroot. As a very fair specimen.

MEDAL.—TASMANIA.

494 Keene, Mr., Kingston, Brown's River.—Curry Powder. Excellence of quality.

MEDAL.—NEW CALEDONIA.

15 Joubert, Mons., Noumea.—Sugar. Very good, similar to a good description of Manilla.

HONOURABLE MENTION.—NEW CALEDONIA.

7 Bavey, M., Imperial Navy.—Cayenne Pepper. Excellence of quality.
9 Boutan, M., Director of the Government Model Farm of Gahoue.—Green Ginger. Very good quality.
9 Boutan, M., Director of the Government Model Farm of Gahoue.—Samples of Coffee, in the husk.
20 Pancher, M., Government Botanist, Noumea.—Arrowroot. Well washed, good colour, fine quality.
25 Pancher M., Government Botanist, Noumea.—Samples of Gluten, from the Maoride; very good.
27 Viellard, Dr., Imperial Navy, Noumea.—Sample of Gluten, from the Pix. A good specimen.

TOBACCO AND SNUFF.

Class III.—Section 7.

H. C. FRASER, ESQ. | F. LAMB, ESQ.

The exhibits of tobacco were on the whole good. The leaf from Belvoir, Ovens, and Gippsland was the best exhibited; in the latter the leaf was large and fairly cured, and suitable for the manufacture of dark tobaccoes, whilst the two former were lighter in colour, and fit for the manufacture of aromatic and mahogany sorts. The principal knowledge to be acquired by the grower is in the curing of the leaf, as inattention in this particular will frequently cause otherwise good tobacco to be unfit for manufacturing. It often happens that light-coloured leaf (aromatic), though apparently good, will not when made up into cigars keep its dryness—it becomes pappy, soft, and unpleasant to the smoker. It would be well

if the growers of tobacco in this and the adjacent colonies would turn more particular attention to the sweating and drying process. In Virginia, Kentucky, Missouri, and other parts of America and Havannah, the modes of drying and sweating differ; and if the cultivators would study the peculiarities of climate and soil, and see in what manner they assimilate with those of the countries named, much valuable information might be gained, much loss and disappointment in the growing and curing of their crops would be prevented, and an industry would be fostered which, in course of a few years, would develope itself into a large trade. Some growers think that the darker the leaf is cured the better: this is a mistake, as the manufacturer colours the tobacco in the process of curing. It is useless for growers to plant large quantities of tobaccoes unless the most careful and studious attention is paid to the curing; this, we think, cannot be too strongly impressed upon them. The soil intended for a tobacco plantation should (if to be successful) be analysed, and the constituent parts lacking in the earth be made up, if possible, by artificial means. As far as our present experience goes, the leaf grown at Wangaratta, Ovens, and Belvoir is the best, and we have no doubt that in course of time these districts will produce a large quantity of leaf tobacco. The manufactured tobacco exhibited was principally made up from imported leaf, some quite equal to the imported article; it was well got up, but in some cases sufficient attention was not paid to the pressing. This is a matter which our manufacturers should endeavour to remedy. Flat tobacco should, to command a good market, be evenly made, of equal thickness, and hard pressed, and not too much colouring matter, as this, when carelessly put in before the pressing, oozes out between the plugs, depreciates the value of otherwise good tobacco, and also causes it to get mouldy much sooner than it otherwise would, and proves that manufacturers cannot be too particular in the getting up and packing of their goods.

In presenting their report, the Jurors think they cannot do better than subjoin to it that of the Jurors of the London Exhibition of 1862, which contains a large amount of valuable information to growers and manufacturers:—

"The leaves of tobacco plants of every variety possess in common the same structure and the same chemical constituents, the latter varying in amount in different varieties of leaf. Of these constituents there are some on which the value of the leaf for manufacturing purposes mainly depends, and to them we must look for a solution of the question why one kind of leaf is better adapted for smoking, chewing, or snuff-making, than another. The constituents referred to are:—

1. Ligneous matter, or woody fibre	3. Extractive matter and gum
2. Nicotine	4. Alkalies
5. Earth.	

"In different kinds of leaf these proportions range as follows, viz.:—

1. Woody fibre .... 43·67 per cent.	3. Extractive matter 15·32 per cent.
2. Nicotine .... 2·12 ,,	4. Alkalies .... 1½·5 ,,
5. Earth .... 6·20 per cent.	

"In Virginian and Kentucky tobacco, the richest and strongest kinds of tobacco known, and which are used chiefly for chewing purposes, we find :—

Woody fibre	43 per cent.	Extractive................	32 per cent.
Nicotine....................	12 ,,	Alkalies (potash)........	5 ,,
	Earth (lime)......... [illegible] per cent.		

"Havannah leaf of the best kind, and which may be taken as the type of what is required for a good cigar, contains the following proportions of the constituents referred to :—

Woody fibre	55 per cent.	Extractive and gum....	21 per cent.
Nicotine....................	6 ,,	Alkali (potash)..........	3 ,,
	Earths.............. 12 per cent.		

"German leaf of the finest quality, such as is used in making cigars, contains in 100 parts about—

Woody fibre	60 per cent.	Extractive and gum....	15 per cent.
Nicotine....................	3 ,,	Alkali (potash, soda)...	2 ,,
	Earths (lime, magnesia) ...... 18 per cent.		

"In the case of the Virginia and Kentucky leaf, where the extractive matter and potash are high, and the lime low in amount, the leaf, if made into cigars and smoked, would burn with a black ash ; and besides this, the nicotine being excessive in quantity, few persons could smoke such cigars without suffering from the effects of the narcotic. Such tobacco is, therefore, only fit for chewing purposes, and to mix with poorer tobacco which is deficient in nicotine. The very opposite of the Virginian and Kentucky tobacco is German. Here we find a low amount of nicotine, extractive matter, and alkali, and a large amount of woody fibre and earths, and the result of this arrangement is that the leaf burns well, with a white friable ash, but the character of the smoke is woody and deficient in aroma. The medium between the two extremes named is Havannah tobacco, and here we have in the best kinds a leaf eminently fitted for the purpose of cigar making. Although Cuba affords but a small quantity of the best kind of leaf tobacco for cigar making, it produces a large quantity of an imperfect kind, much of which is full of character, but burns with a black ash.

"The remedy for this is less potash and more lime and magnesia in the leaf. This may be accomplished by refusing potash to the plant beyond a limited amount, and offering it lime and magnesia freely. By thus treating the soil the plant would form less nicotine and extractive matter, and take up more lime and magnesia, and thus remedy the evil complained of in the imperfect leaves. To carry this out properly, the soil should be examined, and treated according to the constituents it contains and the amount of these required in the plant. Although doubtless much might be accomplished in the growth of tobacco, it is not intended by this to convey the meaning that the one kind of leaf may be made equal to another such as the conversion of German and Dutch leaf into Cuban, or South American into North American. All that is asserted is, that, a standard having been reached in a certain kind of tobacco plant, other plants of the same kind may be made approximate to that standard by judicious cultivation, founded upon scientific acquaintance with the subject."

H. C. FRASER, Reporter.

With a view to show the importance of the above branch of production, the following returns from the Customs Department are given :—

IMPORTS—TOBACCO.

Article.	1860.	1861.	1862.	1863.	1864.	1865.	1866.
	£	£	£	£	£	£	£
Tobacco, manufactured	247,402	189,158	212,546	305,608	622,099	197,284	185,340
„ unmanufactured	—	—	8,700	24,980	36,846	17,227	16,877
„ sheepwash	1,864	1,099	1,747	8,417	8,254	8,141	8,857
„ Cigars	62,621	48,765	46,069	49,220	65,796	79,499	41,187

The following is the List of Awards in this Section :—

MEDALS.—VICTORIA.

34 Henley, James, Oxley Plains, Ovens.—Leaf. Excellence of quality.
182 Hommel, T. and Co., Melbourne.—Tobacco, and Snuff. Excellence of quality.
191 Moss, White and Co., Melbourne—Cigars. Excellence of quality.
195 Owen, Dudgeon and Arnell, Melbourne.—Manufactured Tobacco. Excellence of quality. Leaf—Grown in Gippsland. Well cured and good.
197 Politz, J., and Co., Melbourne.—Manufactured Tobacco.
205 Seppell, J. W., Belvoir.—Leaf. Excellent quality.
213 Tobelman, W. G., Melbourne.—Cigars. Excellent quality.

HONOURABLE MENTION.—VICTORIA.

164 Benjamin, B., Melbourne.—Cigars.
18 Henley, James, Wangaratta.—Manufactured Tobacco.
181 Hodgson, John, Dunolly.—Cigars.
195 Owen, Dudgeon and Arnell.—Snuff, goodness of quality.
198 Politz, J. and Co.—Leaf.

MEDALS.—NEW SOUTH WALES.

53 Baker, John.—Leaf. Excellence of quality and cure.
96 M'Encroe, Edward.—Tobacco. Excellence.
105 Penfold, E. T.—Tobacco. Excellence of quality.
92 Vorbeck, L.—Leaf. Goodness of quality.

HONOURABLE MENTION.—NEW SOUTH WALES.

70 Church, John—Manufactured Tobacco.
108 Schoefer, Rudolph.—Manufactured Tobacco.

MEDAL.—NEW CALEDONIA.

11 Director of the Convict Establishment.—Manufactured Tobacco.

HONOURABLE MENTION.—NETHERLANDS-INDIA.

1 Morgan, Melbourne and Co.—Tobacco.

MEDAL.—MAURITIUS.

28a Bergicourt, M., Mauritius.—Snuff. Excellence of quality.

HONOURABLE MENTION.—MAURITIUS.

28 Bergicourt, M.—Manufactured Tobacco.

TIMBER.

Class III.—Section 7 b.

H. U. ALCOCK, ESQ., CHAIRMAN.
EDMUND ASHLEY, ESQ. | WILLIAM PORTER, ESQ.

THE Jurors have much pleasure in bringing up their report on the present occasion. The great and varied collection of timber from the Australian colonies, also from New Zealand, Tasmania, New Caledonia, and Netherlands-India, is remarkably complete and interesting. The Jurors have carefully examined the different specimens exhibited, and highly compliment the exhibitors for their varied collections, and for those kinds of timber most useful and ornamental they have awarded the highest merit they have at their disposal.

They also enumerate some of the timber most generally used and applicable for the different purposes, as follows:—

BLACKWOOD.—The most valuable of all our (at present known) colonial timber is the *Acacia melanoxylon*, or blackwood, sometimes called lightwood. It is extensively used in the construction of railway carriages, and is well adapted for light and heavy framing purposes, gun stocks, coopers' staves, and turners' work, and in this respect contrasts favourably with most of the English woods; and from the facility with which it is bent into the most difficult curves it is highly prized for buggy and gig shafts, &c., of which there are several specimens exhibited. Within the last few years it has been introduced extensively into the manufacture of the finer description of furniture, such as drawingroom suites, and is found far superior to walnut, owing to its strength and toughness. Blackwood resembles in figure different woods, such as walnut, mahogany, rosewood, zebrawood, &c. Formerly, mahogany was extensively imported for the purpose of manufacturing billiard tables, owing to the prejudice existing against the blackwood, and we must say justly so, as there was no care taken to select or season it, nor was the least attention paid to the proper season for felling it, but at the present time blackwood has taken the place of mahogany in the above-named manufacture, which has become one of the staples of the colony. It is pronounced to be far superior to the best Spanish mahogany for this purpose; owing to its density and resisting qualities, it is acted on very slightly by the changes of weather, and is capable of taking a fine polish. In the pianoforte cases exhibited by Messrs. Wilkie, Kilner and Co., there are very fine specimens (from the Dandenong Ranges) to be seen.

BLUE GUM.—The *Eucalyptus globulus*, or blue gum, is a hard, light-coloured timber, of great durability, and is used in the erection of buildings for beams, joists, &c., and for railway sleepers, piers, and bridges. It is also well adapted for ship-building purposes; from the great length in which it can always be procured, it is especially suitable for outside planking, and has been used for masts of vessels, but owing to its great weight, for the latter purpose has given place to Kaurie, or New Zealand pine, as being more suitable for masts and spars; it is also bent and used for street cab shafts, &c.

RED GUM.—The *Eucalyptus rostrata*, or red gum, is a very hard, compact wood, possessing a very handsome curly figure; it is of a bright red colour, and suitable for veneering purposes for furniture, &c.; it is found

in abundance in many parts of the colony, and is largely used for posts for fencing purposes; it has been proved to stand intact from rot or decay for several years, and in this respect resembles the jarrah, or Swan River mahogany, more closely than any other timber at present known. When properly selected and seasoned, it is well adapted for many purposes in ship-building, such as heavy framing and the beams and knees of vessels; it is also used in the construction of culverts, bridges, wharves, and by wheelwrights for the felloes of heavy wheels, and is much approved of for railway sleepers and engine buffers.

STRINGY BARK.—*Eucalyptus obliqua*, or stringy bark, obtains its name from this characteristic of its bark. It is a hard, straight-grained timber, bearing a great resemblance to blue and white gum. Although of an inferior class, it is used for a great variety of building purposes, notwithstanding its well-known liability to warp or twist, and its susceptibility to dry rot. It splits with facility, forming posts, rails, and paling for fencing, and shingles for roofing.

WHITE GUM.—*Eucalyptus goniocalyx*, or the white gum, which grows among the mountain ranges. Several species of *eucalypts* yield the timber which passes current as white gum; all present the same general character of a hard, straight-grained timber, and are similarly employed in the erection of buildings for joists, beams, and rafters; it is found suitable for most descriptions of heavy framing, and is occasionally used for staves of casks.

HUON PINE (from Tasmania), *Darrydium Franklinii*, is considered one of the handsomest and most suitable timbers for bedroom furniture. It bears a strong resemblance to satinwood. From its well-known lasting qualities it is much prized for ship-building; and it has been known to stand in a vessel's planking for twenty years, without the least sign of decay or rot.

KAURIE, OR NEW ZEALAND PINE *(Dammara Australis)*, is one of our most useful timbers for building and general purposes; and it is a matter of wonder why it is not in more general use, as it is easily obtained, and at a moderate price. It is used for ships' masts and spars, and can be procured in spars of sufficient size for masts of the largest vessel afloat. For deck planking it cannot be excelled; it is also extensively used in the manufacture of break-blocks for railway engines and carriages, and is much approved of for flooring, as it is found to wear evenly, and is not so liable to splinter as the Baltic or deal flooring at present so much in use, and for which we send a large amount of capital annually out of the colony.

IRONBARK (*Eucalyptus sideroxylon*, or ironbark).—The *Eucalyptus sideroxylon*, or ironbark, is one of the hardest and heaviest of our native woods, and has a peculiarly thick and rugged bark, with deep, longitudinal fissures, which is strikingly characteristic. It possesses great strength and tenacity, and has a close and straight grain, on which account it is highly useful to the coachmaker and wheelwright for the poles and shafts of carriages and the spokes of wheels. Its greasy nature also renders this wood very serviceable to the millwright for the cogs of heavy wheels. It is also valuable for many purposes in ship-building, and constitutes one of the most imperishable of our timbers.

BOX (*Eucalyptus leucoxylon*, or boxwood) is a valuable timber, of a light-grey colour and a greasy nature, remarkable for the hardness and closeness of its grain, its great strength and tenacity, and its durability,

both in the water and when placed on the ground. It is largely used by coachmakers and wheelwrights for the naves of wheels and for heavy framing, and by millwrights for the cogs of their wheels. In ship-building it has numerous and important applications, and forms one of the best materials for treenails, and for working into large screws in this and other mechanical arts.

GREY BOX (*Eucalyptus dealbata*, or grey box) is another species also known as the box, or grey box, and is used for similar purposes to the preceding. After the removal of the bark it is most difficult, if not impossible, to distinguish between the species.

MESSMATE (*Eucalyptus fissilis*, or messmate) has many of the characteristics of the white gum, is hard and straight-grained, and splits readily into posts, rails, palings, and shingles, for fencing and building purposes. Wheelwrights use it for the shafts and framing of drays, for plough-beams, and many similar applications.

WOOLLYBUTT (*Eucalyptus woolsii*, or woollybutt) is a hard, straight-grained timber of a reddish colour, used by coachmakers and wheelwrights for the spokes of wheels, though considered inferior for these purposes to the ironbark. It is also split into posts and rails for ordinary fencing.

MOUNTAIN ASH (*Eucalyptus inophloia*, or mountain ash) is so called from a fancied resemblance to the British timber of that name, and is employed by the coachmakers for bending into the form of shafts for light vehicles, for which it is well adapted. It has not hitherto received the attention it deserves, being ordinarily used for splitting into palings for fencing and other inferior applications; it is much like the white gum, and may be used for similar purposes.

APPLE TREE (*Angophora intermedia*, or apple tree) grows within Victoria only, in the eastern part of Gippsland, and forms a valuable timber for coachmakers and wheelwrights, who use it extensively for the naves of wheels.

BEECH (*Fagus Cunninghamii*, or beech, generally named the Tasmanian Myrtle) is essentially a beech, and found in considerable quantities in some of the mountainous parts in the more southern parts of Victoria. It is a reddish-coloured wood, and much employed by cabinet makers for various articles of furniture. Occasionally planks of it are obtained of a highly beautiful grain and figure, and when polished its highly ornamental character is sure to attract attention. It is also used for the cogs of wheels by millwrights.

SHEOAK.—The *Casuarina leptoclada*, *quadrivalvis*, and *cristata*, are species of the sheoak well adapted for various furniture purposes from the singular beauty of their grain. They are used for certain applications in boat-building, but are rarely found to exceed from two to three feet in diameter. It is an excellent wood for turnery purposes and the manufacture of ornamental work. In some parts of the colony this wood is known by the name of beefwood.

BLACK WATTLE.—The *Acacia mollissima*, or common black wattle, is abundant in every part of the colony, and its timber is used for staves of casks by coopers, while the bark is extensively employed for tanning purposes.

MUSKWOOD (*Aster argophyllus*) grows in densely scrubby places among the mountain ranges, which makes it difficult to get out. This timber

never grows very high; it has a pleasant fragrance, is of a beautiful mottled colour, and well adapted for veneering, fancy articles of furniture, pianofortes, &c., specimens of which can be seen in the exhibits of Mr. W. Blazey, pianoforte manufacturer, Richmond.

JARRAH (Swan River mahogany), *Eucalyptus marginata*, from Western Australia, one of the best timbers grown in the colonies, is used for railway sleepers, and much prized for this purpose in India, as it is well known to resist the attacks of the white ant; it is also used for piles, and will stand for an interminable length of time without giving any indication of decay. We have proof of its durability from a pile exhibited that has stood the test for twenty-five years without the least sign of decay. It grows to an immense size, attains a great height, and is very plentiful. It is also used for furniture, and stands well, as it is very close grained and takes a fine polish.

CEDAR (*Cedrela Taona*), from New South Wales, is a most valuable and useful timber, and is largely used for furniture and office fittings; it bears a close resemblance to mahogany, but is of a softer nature, and more open in the grain. There are large quantities imported into this colony from the Richmond, Clarence, Bellinger, and other rivers, where it abounds. It grows to an immense size; one tree alone has been known to yield 80,000 feet of fine timber. It stands the test of climate well, and does not require the same amount of seasoning as blackwood; it is of a much softer nature, but takes a very fine polish, and is suitable for diningroom furniture, &c. There is a fine specimen plank of it to be seen in the Victorian Court, exhibited by Messrs. M'Kendrick and M'Ewan.

HENRY UPTON ALCOCK, CHAIRMAN.

The following is the List of Awards in this Section:—

MEDALS.—VICTORIA.

11 **Bevan, T., Wangaratta.—For Slab of Red Gum.**
— **M'Kendrick and M'Ewan, Melbourne.—For large Specimen Plank of Cedar, 12½ feet by 4½ feet by 2½ inches.**
203 **Robinson, W. G., Berwick.—For Specimens of Laurel, Honeysuckle, and Beech from Gippsland.**
42 **Rutherglen Borough Council.—Specimens of Murray Pine.**
552 **Scotson, S., Castlemaine.—For Specimens of Timber, suitable for and manufactured into Axe and Pick Handles.**
24 **Summers, J. C., Wangaratta.—For Plank of Red Gum and Ironbark.**
214 **Turner, William, Lilydale.—For Specimens of Blackwood and Musk, suitable for furniture, pianofortes, &c.**
— **Victorian Commissioners.—For Myall, Murray Box, Myrtle, Red Gum, Blackwood, and Blue Gum.**

HONOURABLE MENTION.—VICTORIA.

91 **Bishop, Joseph E., Ovens and Murray.—For seven different specimens of Timber, manufactured into a Wheel.**
19 **Clarke, Mr., Bullarook.—For Specimen Plank of Messmate.**
173 **Costin, Henry, Ballarat—For Collection of Timber, suitable for cabinet-work; also for palings, vine stakes, &c.**
50 **Shire Council, Hampden.—For Specimens of Box and Lightwood; also, for Myrtle, suitable for axe handles, &c.**
214 **Turner, William, Lillydale.—For Axe and Pick Handles.**

MEDALS.—NEW SOUTH WALES.

74 Cuthbert, John, Shipbuilder, Sydney.—For thirty Specimens of different Timbers.
87 Hill, Edward, Sydney.—For Specimens of Illawarra Pine, White Pine, and Oak.
98 Moore, Charles, Botanic Gardens.—For Specimens of Bean-tree, Yellow-wood, Rosewood, Oak, &c.

HONOURABLE MENTION—NEW SOUTH WALES.

88 Hinton, John, Cabinetmaker, Hunter-st., Sydney.—For Mountain Beech, Cedar, &c.
91 Lambert, W., Grafton.—For Six Specimens of different Timbers from Clarence River.

MEDALS.—TASMANIA.

237 Boyd, J., Port Arthur—For Specimens of Figured Muskwood, Myrtle, Blackwood, &c., forming the most useful and extensive collection of timber exhibited.
219 Douglas, Ayde, Launceston.—For Plank of Blackwood.
236 Hooper, G., Hobart Town.—For Muskwood Root, polished.
233 Rout, W., New Town.—For Specimens of Muskwood.

HONOURABLE MENTION.—TASMANIA.

25 Boyd, J., Port Arthur.—For Specimen Planks of Blue Gum, White Gum, and Stringy Bark.
638 Dyer, B. B., Hobart Town.—For Gordon River Pine, manufactured into a pair of Sculls.
288 Hood, R. L., Hobart Town.—For Specimens of Huon Pine.
250 Pitt, William, Sandy Bay.—For Specimens of Sheoak.
227 Scott, J. R., Launceston.—For Planks of Celery-top Pine.

MEDALS.—QUEENSLAND.

— Hill, Mr., Government Botanist.—For Collection of Timber.
19 Thozet, A., Rockhampton.—For one hundred different Specimens of Timber.

MEDALS.—WESTERN AUSTRALIA.

37 Central Committee.—For Specimens of Jarrah Wood, Jarrah Pile, &c. This collection of timbers is worthy of special notice.
82 Mason, B., Swan River, Perth.—For Specimens of Mahogany, or Jarrah Wood.

HONOURABLE MENTION.—WESTERN AUSTRALIA.

31–32 Barker and Gull.—For Specimens of Raspberryjam Wood and Sandal Wood.
37 Central Committee.—For Specimens of Oak, Raspberryjam Wood, and Jarrah.
93 Mason, B., Perth.—For Specimen of Sandal Wood.
99–100 Saw, Henry.—For Samples of Mahogany, polished.
115 York District Committee.—For a Specimen of Naves, of York Gum.

MEDAL.—NEW ZEALAND.

44 Kelly, Thomas.—For Specimens of Red Pine and other New Zealand Timbers.

HONOURABLE MENTION.—NEW ZEALAND.

51 Smith, John, Invercargill.—For Specimens of New Zealand Timbers.

MEDAL.—NEW CALEDONIA.

9 Boutan, M.—For Samples of Timber.

NOTES ON THE VEGETABLE PRODUCTS

IN THE

INTERCOLONIAL EXHIBITION OF 1866.

BY FERDINAND MUELLER, PH.D., M.D., F.R.S., &c.

INTRODUCTORY NOTES TO THE VICTORIAN COLLECTION OF TIMBER AT THE INTERCOLONIAL EXHIBITION.

THIS series of wood samples was brought together on behalf of the Royal Commission. It comprises representatives of barely one-half of the timber trees known to exist within the limits of the Victorian colonial area; but, inasmuch as the localities richest in the diversity of their trees are also the least accessible; as, moreover, but in few places the timber is obtainable at frequented shipping ports, and as but very slender means were available for bringing together a display of all our timber, the collection is now less extensive than that formed in 1861 for the London Exhibition. Nevertheless, it comprises nearly all the leading kinds of wood which have attracted hitherto more or less commercial attention, and displays—at least in some samples—the huge dimensions of many of our trees, broad planks of blackwood, evergreen beech, red gumtree, and a few other kinds of eucalypts, having been secured. To demonstrate still more fully the gigantic size of some of our timber trees would have involved means over which I had no command; but a drawing in the Victorian Timber Court will more readily exemplify how, by a moderate outlay, the colossal sizes of our trees could be brought before the eye of the general population. This design demonstrates, in a monumental structure, how the slabs of various sections of the stem and branches could be placed over each other for showing the proportionate dimensions. Thus, for instance, we might have a fair illustration of a tree of *Eucalyptus amygdalina*, ascertained by Mr. D. Boyle to have attained, in the valleys of Dandenong, a height of 420 feet. These trees do not merely exceptionally rise to this amazing height, but, contrarily, very many, in the deep recesses of the mountains, advance to the same magnitude; and this we see repeated in regard to other tall kinds of *Eucalyptus* in other parts of the country. It would appear from measurements hitherto extant as if, even in Tasmania, the sizes of trees fall short of ours, perhaps because of the mean annual heat of the forest ranges in that island being somewhat less than the temperature of our wooded mountains. There is only one instance on record which brings certain of our highest trees in rivalry with those of the other Australian colonies—the instance

of a measurement of the *Karri Eucalypt*, on the Warren River, Western Australia, where Mr. Pemberton Walcott's measurements gave a result of, approximately, 400 feet. It is by no means thus unlikely that Victoria possesses the most elevated trees of the globe, excelling even those so famed for enormous height in California. It would be of the highest interest if actual measurements of these giants of the forest could be obtained wherever they occur; and in Australia they would be of all the more significance, as here the extraordinary dimensions of the trees is not so much the result of very great age but extreme rapidity of growth—a quality which has rendered our trees already so celebrated, and caused their introduction—for fuel, shelter, building purposes, and other intentions—to be effected into many of those countries which bear a clime similar to ours.

It may on this occasion not be out of the scope of reference to draw attention to the very promising quantity of tar, acetic acid, and wood spirits obtainable from timbers either not sufficiently accessible for the operations of sawmills, or (as in the instance of the *Melaleuca ericifolia*, which covers all our swamps) not of sufficient size to be used for building purposes. A series of these tars, &c., prepared under my direction by Mr. A. Hoffmann, in the laboratory of the Botanic Gardens, from ten of our trees, of which nine are very widely prevailing over most others, is placed in the Exhibition, and will become the subject of a special memoir. When viewing our trees, it should also be remembered that not merely for the purposes indicated, but also for obtaining potash, tannic and gallic acid, dye material, volatile oil, and paper material, trees of such vast abundance should find full appreciation. One branch of industry has already sprung up for utilising the latter-mentioned products. I refer to the extensive distillation of oil from Eucalypts and species of *Melaleuca*. This industry was initiated by the distillation of about thirty species of oils for the last London and Victorian Exhibition. It was undertaken at my request, and from material selected by myself, chiefly by Mr. Joseph Bosisto, the present Mayor of Richmond, who, with a most praiseworthy spirit of enterprise, when thus becoming aware of the great yield of oils, gave to this branch of industry commercial dimensions. This use of our native trees might be advantageously followed up in other directions, and for other purposes, for the benefit of unprovided families, and for the lucrative employment of capital.

The main number of the wood specimens were secured by the Royal Commission through a few special emissaries; but some valuable additions were made by the contribution of Wimmera timber through Samuel Wilson, Esq.; Gippsland woods from near Port Albert, by Mr. Commissioner Tyers; Murray timber, by Allan Hughan, Esq., and Peter Beveridge, Esq.; Mount Macedon timber, by J. Snowball, Esq.; and Berwick timber, by G. W. Robinson, Esq. These contributions have added more to the specimens than to the species, and are interesting for comparing the same wood from various—occasionally even geologically different—localities. In adopting a nomenclature for the woods it is difficult, without new inventions, to assign to them other than strictly scientific names; it would, indeed, be a great gain if the present colonial names, on account of their ambiguity or their want of logical meaning, or their absolute incorrectness, could be entirely discarded, and new names, based on the well-fixed appellations by which they are now fully known in the scientific world, could be substituted. It is my intention to elaborate

this subject in detail. A convenient method to demonstrate within narrow space the qualities of wood, both scientifically and technologically, was adopted by the writer at the last Exhibition, in preparing the specimens as small boxes in book-form, the back-title giving the systematic name and native country of each special tree. According to this design a fine collection of wood-books (if we may term them so) was caused to be prepared by Colonel Champ, and it could be wished that for our future Industrial Museum every kind of wood, at least of Australia, might be secured in this form for the sake of easy access and comparison. Planed and polished surfaces are thus readily and elegantly shown, while the cavity of the imitation book serves for placing in it samples of such products as the particular tree may yield.

VICTORIAN TIMBER EXHIBITED BY THE COMMISSIONERS OF THE INTERCOLONIAL EXHIBITION.

Notes on the size and distribution of these trees within the territory of Victoria, by Ferd. Mueller, M.D., F.R.S.

Atherosperma Moschatum: Labillardière—*The Sassafras Tree.*—In deep, wet, forest ravines. A middle-sized tree.

Hedycarya Cunninghami: Tulasne—*Native Mulberry Tree.*—Extends through the whole southern fern-tree country, where it forms a middle-sized tree.

Eupomatia Laurina: R. Brown.—Occurring only in the most eastern part of Gippsland, where the tree attains a height of 40 feet.

Pittosporum Undulatum: Ventenat.—In the humid forest glens from Western Port and Dandenong, eastward throughout Gippsland. Attains in favourable localities a diameter of 2 feet.

Pittosporum Bicolor: Hooker.—In the fern-tree gullies; also in the beech-regions. A small, and occasionally a middle-sized tree.

Codonocarpus Cotinifolius: Ferd. Mueller—*The Radish Tree.*—In the Mallee scrub rather sparingly. Attains a height of 30 feet.

Busbeckia Mitchelli: Ferd. Mueller—*The Caper Tree.*—A small tree, very rare in the Mallee scrub opposite Euston.

Brachychiton Populneum: R. Brown—*The Bottle Tree.*—In more open forest valleys on the Hume River, the Snowy River, and thence to the eastern limits of Gippsland. Height of the tree, up to 60 feet. Wood exceedingly soft.

Acacia Melanoxylon: R. Brown—The *Blackwood Tree*, also by colonists called the *Lightwood Tree.*—On fertile banks and flats of rivers, also on basaltic ridges; not rare in deep forest gullies; attaining a height of 120 feet and a diameter of the stem of 3 to 4 feet.

Acacia Implexa: Bentham.—On open ridges of the lower silurian formation in many parts of the colony, but nowhere common. A middle-sized tree.

Acacia Penninervis: Sieber.—Scattered through the eastern half of the colony over ridges and ranges, gregarious on some of the bushy sub-alpine declivities and plateaux.

Acacia Supporosa: Ferd. Mueller.—Restricted to the east part of Gippsland. A middle-sized tree.

Acacia Verticillata: Willdenow.—In swampy forest valleys common, where it becomes a small tree.

Acacia Salicina: Lindley.—Not unfrequent in the Mallee scrub. The wood dark, heavy, and durable. A small or occasionally middle-sized tree.

Acacia Homalophylla: All. Cunningham—*The Myall.*—In the Mallee scrub on many localities.

Acacia Osswaldi: Ferd. Mueller.—In the Mallee scrub not uncommon, always remaining a small tree. The plant is exquisitely adapted for tall hedges.

Acacia Stenophylla: All. Cunningham.—In Victoria restricted to the banks of the Murray and the Lower Wimmera and Avoca. A middle-sized tree.

Acacia Decurrens: Willdenow (*A. Mollissima* W., and *A. Dealbata* Link)—*The Wattle.*—Frequent throughout the colony, except the desert tract. In the ferntree gullies forming a tree 150 feet high.

Eucalyptus Rostrata: Schlechtendal—*The Red Gumtree.*—Along river banks—almost everywhere.

Eucalyptus Leucoxylon: Ferd. Mueller—*The Ironbark Tree.*—On many of our less fertile ridges, usually indicating an auriferous country.

Eucalyptus Melliodora: All. Cunningham.—On low open ridges, particularly of the miocene formation. A middle-sized tree, comprised among those called on some places *Box Trees,* on others *Peppermint Trees,* on some, again, *Yellow Box Trees.*

Eucalyptus Viminalis: Labillardière—*The Manna-Eucalypt.* On grassy ridges; not rare. A middle-sized tree.

Eucalyptus Goniocalyx: Ferd. Mueller—*One of the White Gumtrees.*—A gigantic tree, occurring in nearly all our moist forest ranges, intermixed with other eucalypts.

Eucalyptus Corymbosa: Smith—*The Bloodwood-Eucalypt.*—In Victoria confined to the eastern part of Gippsland. A rather large tree.

Eucalyptus Longifolia: Link—*The Woollybutt-Eucalypt.*—Restricted in Victoria to the eastern part of Gippsland, forming a tall, stately tree.

Eucalyptus Amygdalina: Labillardière—*One of the Peppermint Trees.*—In forest country of the southern and eastern parts of the colony; in more open places a middle-sized tree, in deep ravines of colossal size. This species may be the tallest of the globe, perhaps only rivalled by the *Wellingtonia gigantea* of California. In the Dandenong Ranges it has been measured repeatedly 420 feet, and towards the sources of the Yarra it is said to attain a still greater height. It is this tree also which yields the largest percentage of oil from the foliage, varying from 2 to 4 per cent. from fresh leaves and branchlets.

Eucalyptus Stuartiana: Ferd. Mueller—*One of the White Gumtrees.*—In moist localities, as well in plains as ranges. A tree of an enormous size in Victoria, perhaps only surpassed by the *Eucalyptus amygdalina* and the *Karri Eucalypt* of West Australia *(E. diversicolor or E. colossea).*

Eucalyptus Obliqua: L'Heritier—*The Stringybark Tree.*—Constitutes the main mass of the forests in wide extent of our more barren mountains. The height of trees of greatest size ranges from 300 to 400 feet.

Eucalyptus Globulus: Labillardière—*The Blue Gumtree of Victoria and Tasmania* (but not of New South Wales and West Australia).—Restricted

to Victoria and Tasmania. The tree is confined to forest valleys, except near the coast, where, usually of diminutive size, it will occupy open spaces. In deep declivities it grows to nearly the same colossal size as *E. amgydalina*, *E. goniocalyx*, *E. Stuartiana* and *E. obliqua*.

Melaleuca Ericifolia : Smith—The so-called *Tea-tree*, though never used for preparing any beverage.—It fills most of our swamps of brackish, as well as fresh water, and lines also innumerable watercourses. It is never a large tree, but, on the contrary, generally small, though it may be seen occasionally 50 to 60 feet high.

Melaleuca Squarrosa : Smith.—Common in swamps of many southern forest regions, but not often growing to the size of a tree. In favourable situations the stem attains a diameter of two feet.

Leptospermum Laevigatum : Ferd. Mueller.—Everywhere on the sandy coast. Never a large tree.

Tristania Laurina : R. Brown.—Along the rivers of East Gippsland. But a small tree.

Angophora Intermedia : Candolle.—The spurious Apple-tree of East Gippsland ; it does not advance farther westward. A fine, umbrageous, middle-sized tree, of fair celerity of growth, well worthy of being adopted as an avenue-tree.

Pomaderris Apetala : Labillardière.—In forest glens and along wooded river banks; not rare in the southern and eastern part of the colony, but never seen away from moist, shady, and sheltered forest valleys.

Senecio Bedfordii: Ferd. Mueller—*The Duke's Tree.*—A small tree, in all fern-tree gullies and in other shady springy glens.

Aster Argophyllus : Labillardière—*The Musk-tree.*—Confined to moist, umbrageous forest gullies, but there abundant. It never exceeds 60 feet in height, and is generally lower.

Cassinia Aculeata : R. Brown.—Frequent in moist, wooded tracts of the colony. Oftener a shrub than a small tree.

Coprosma Microphylla : All. Cunningham.—In forest-swamps and periodically inundated river-banks. Not rare throughout the southern and eastern districts. More generally a shrub than a small tree, but never even a middle-sized tree.

Panax Palmaceus: Ferd. Mueller.—*The Palm-Panax.*—In Victorian territory only to be found on the south-eastern borders of New South Wales. The slender palm-like stem attains seldom above 1 foot diameter, though not rarely a height of 80 feet. The wood is singularly light and soft.

Myrsine Variabilis: R. Brown.—In the forest glens and on river banks in the southern and eastern parts of the colony. Generally a small, occasionally a middle-sized tree.

Myoporum Platycarpum: R. Brown—*The Sugar-tree.*—In the Mallee scrub. A small tree, exuding from its bark a saccharine substance.

Santalum Persicarium : Ferd. Mueller—*Native Sandalwood.*—In the Murray desert. A small tree; its wood is far inferior to the famed sandalwood of commerce.

Santalum Acuminatum : A. De Candolle—*The Native Peach.*—In the Mallee scrub. Always only a small tree.

Exocarpus Cupressiformis : Labillardière—*The native Cherry-Tree.*—Widely distributed over the more fertile open ridges, and through both barren and fertile forest ranges. A small or middle-sized tree, of comparatively quick growth.

Banksia Serrata: Linné—*The Heath Honeysuckle.*—On the sandy heaths of Gippsland rather frequent. A small, or occasionally middle-sized, tree.

Banksia Australis: R. Brown—*The common Native Honeysuckle.*—In less fertile localities all over the colonial territory, ascending to sub-alpine elevations. A small, or middle-sized tree.

Lomatia Fraserii: R. Brown.—In forest valleys, especially among ferntrees, not very common, but ascending to high cold elevations along the rivulets. A good-sized tree.

Hakea stricta: Ferd. Mueller—*The Water-tree.*—In the Mallee desert. A small tree, water obtainable from the root.

Casuarina Quadrivalvis: Ventenat—*The Drooping Sheoak.*—Frequent in grass lands of plains and hills, and along the sandy coast. A quick-growing, middle-sized tree.

Casuarina Leptoclada: Miquel—*The Straight Sheoak.*—On grassy ridges of the lower as well as higher regions, not rare. A moderate-sized tree.

Casuarina glauca: Sieber—*The Desert Sheoak.*—In the Mallee scrub. A middle-sized tree.

Fagus Cunninghami: Hooker—*The Native Beech.*—In the most secluded recesses of the mountains, from Dandenong to Mount Baw-Baw, on the various remote sources of the Latrobe river, at Wilson's Promontory, and in the Cape Otway ranges. A magnificent tree, attaining a height of 200 feet. On the Mount Baw-Baw Ranges this beech mainly constitutes for many miles the forest. It exists only in Victoria and Tasmania.

Callitris Verrucosa: R. Brown—*The Desert Cypress Pine.*—More or less copiously dispersed through the Mallee scrub, in some directions abundant. A middle-sized tree.

Callitris Cupressiformis: Ventenat—*The Mountain Cypress-Pine.*—On rocky, not densely timbered ranges; thus, on the Grampians, the Ovens ranges, and the Genoa Ranges. A middle-sized tree.

REMARKS ON TIMBER FROM EAST GIPPSLAND, BY LOCKHART MORTON, ESQ.

Eucalyptus Longifolia: Link—*Woollybutt.*—This seems an excellent timber. It is like ironbark, much used for wheel spokes. It bears a high character for durability when used for fencing purposes. As posts, it is said to stand undecayed in the ground for twenty years. The bark is fibrous. This wood is esteemed an excellent fuel.

Brachychiton Populneum: R. Brown—*Currijong.*—This is a soft timber. When dry, it is soft and spongy. The wood is fibrous, and the young wood immediately below the bark is sweet, juicy, and, I believe, nutritious. The bark is thick, and abounds with strong, coarse fibre.

Eucalyptus Corymbosa: Smith—*Bloodwood.*—The value of this timber is not known, except as an excellent fuel. It is not an easily split timber, and the number of resin-veins throughout it is much against its being used. It is said to be very durable when used in fencing. The bark is almost void of fibre.

Angophora Intermedia: Candolle—*Spurious Apple-tree.*—This wood

is but little used, except as fuel; for this purpose it is considered very good. It is said to be used for naves by wheelwrights. The bark contains but little fibre.

Banksia Serrata: L.—This timber is soft, and short in the grain; it is high-coloured, and singularly marked. The bark is very thick, and seems to contain much tannin, as well as a reddish-purple dye. I have seen moleskin trousers which had been tanned and dyed with this and wattle-bark; the colour was a rich dark purple.

Acacia Supporosa: F. Mueller—*Native Hickory.*—This I consider a valuable wood for many purposes. It is exceedingly tough and elastic; would make good gig-shafts, handles for tools, gun-stocks, &c., and seems to contain some inflammable material. Tall straight spars, fit for masts, can be obtained from 50 to 100 feet long and 18 inches in diameter.

Panax Palmaceus: Ferd. Mueller—This timber is soft and very light, floating even when unseasoned half out of water. The wood is white, and has a large pith. The trees are generally from fifteen to eighteen inches in diameter at the butt, and rise with a clear straight stem to the height of fifty or sixty feet; then throw out branches at right angles, adorned at their extremities with a dense mass of foliage.

Exocarpus Cupressiformis: Labill.—*Native Cherrytree.*—This is a soft fine-grained timber, and is the best wood I know for carving.

NAMES OF DIFFERENT WOODS, &c., USED BY THE YARRA NATIVES FOR WEAPONS AND IMPLEMENTS.

Ascertained by C. Walter, the Material identified by Dr. Mueller, F.R.S.

BINNAP (Manna Gumtree, *Eucalyptus viminalis*—Labill.), for Geeaus (flat shields).

BALLEE (Cherrytree, *Exocarpus cupressiformis*—Labill.), for Gurrecks (spear-throwers).

BURGAN (Mountain Teatree, *Kunzea peduncularis*—Ferd. Mueller), for Goyjums (kangaroo spears), Breapang or Warra-Warras (fighting sticks with bead ends), Gudjerons (waddies or clubs), Wankins (fighting boomerangs).

DARGOYNE (Messmate, *Eucalyptus*), for Goyjums (spears).

DJELWUCK (*Hedycarya Cunninghamii*—Tulasne), for Spear Ends and Fire-sticks (native fire kindler).

KARAWUN (*Xerotes longifolia*—R. Brown), for Baskets.

BOWAT (*Poa Australis*—R. Brown), for Net Bags (ballang cowat).

MOOEYANG (Blackwood, *Acacia melanoxylon*—R. Brown), for Mulgar or Club Shields.

WOOLIP (Light Tea-tree Shrub, *Leptospermum lanigerum*—Aiton), for Goyjums (kangaroo spears).

WAYETUCK (She-oak, *Casuarina leptoclada*—Miquel), for Boomerangs.

WOORGOOK, or WANGNARRA (Stringybark-tree, *Eucalyptus obliqua*—L'Heritier), the fibre of which is used for strings on Baskets, Spears, &c.

JARK (Gum, from any portion of *Acacia mollissima*—Willdenow), which

is used for fixing the bottom ends of the Spears and taken from a small wattle-tree (*Acacia*) in the Loddon district.

GARRONG (Wattle-tree, *Acacia mollissima*—Willdenow), for Mulgas (club shields), Boomerangs, and Spears.

MYALL (*Acacia homalophylla*—A. Cunningham).

MALLEE (*Eucalyptus gracilis*—Ferd. Mueller).

TARNOCK (drinking vessel), and also a model of a Coorong (canoe), bark of *Eucalyptus viminalis*—Labill.

EASIP (Spurious Ironbarktree, *Eucalyptus leucoxylon*—Ferd. Mueller).

BAGGUP (*Xanthorrhœa Australis*—R. Brown).—The peduncle is used for the lower portions of Spears.

NOTES ON SOME OF THE TIMBER SPECIMENS FROM NEW SOUTH WALES.

By Charles Moore, Esq., F.L.S., Director of the Botanic Gardens, Sydney.

1. *Trochocarpa Laurina:* R. Br.—A small-sized tree, plentiful in all the cedar brushes from Brisbane Water to the Tweed River.

2. *Weinmannia Paniculosa:* Ferd. Mueller.—A tree of moderate size, found in all the thick brushes on the eastern coast of N. S. Wales from the Manning to the Tweed rivers.

3. *Sloanea Australis:* Ferd. Mueller.—A large tree, frequently attaining a height of 200 feet, with a clear trunk of 50 feet and a diameter of 3 to 4 feet, plentiful at Camden Haven and on the Richmond River. Specimen of wood cut from a branch.

7. *Atherosperma Micranthum:* Tulasne—*Brush Box.*—A tree of small size, very plentiful on the Manning and Hastings rivers.

8. *Tarrietia Argyrodendron:* Bentham.—A tree attaining a large size, frequently with a clear straight trunk of 70 feet, with a diameter of from 3 to 4 feet, called stonewood by the colonists; found in abundance on all the rivers on the east coast of New South Wales from the Manning to the Tweed rivers.

10. *Geissois Benthamii:* Ferd. Mueller.—A tree of large size, frequently attaining a height of 200 feet, with a clear trunk of 60 feet, and a diameter of 1½ to 2 feet. This specimen was cut 30 feet from the base.

12. *Schizomeria Ovata:* Don.—A tree of large size, found in all the thick brushes on the east coast of New South Wales from the Manning to the Richmond rivers.

13. *Orites Excelsa:* R. Br.—A moderate-sized tree, found on all the rivers on the east coast of New South Wales.

14. *Pennantia Cunninghamii:* Miers.—A moderate-sized tree, found in the thick brushes on the Manning and Hastings rivers.

19. *Helicia Glabriflora:* Ferd. Mueller.—Small tree, found in the mountain brushes on the Hastings River.

20. *Anopterus Macleayana:* Ferd. Mueller.—A small-sized tree, with large and handsome foliage, plentiful at Port Macquarie, and found in many other places in thick brushes on the east coast of New South Wales.

21. *Cargillia Pentamera:* Woolls and Mueller.—A moderate-sized tree, plentiful in the mountain brushes on the Hastings River, where it is

called *black myrtle*. This name is also applied to another species of Cargillia by the settlers on the Clarence River.

22. *Stenocarpus Salignus*: R. Brown—*Port Macquarie Silky Oak*.—Found in all the thick brushes on the east coast of Australia. Timber much used by coopers.

23. *Litsaea Dealbata:* Nees.—A tree of moderate size, found in abundance near Port Macquarie, and in many of the thick brushes on the Hastings and M'Leay rivers.

24. *Syncarpia Leptopetala:* Ferd. Mueller.—A tree of moderate size, very plentiful in some of the thick brushes on the Hastings River. Wood very hard when fresh, but not much used.

25. *Callitris Macleayana:* Ferd. Mueller—*Port Macquarie Pine*.—A small-sized tree, found near Port Macquarie, where it is much used for shingles.

28. *Castanospermum Australe:* A. Cunningham—*Moreton Bay Chesnut, or Bean-Tree*.—A tree of very large size, and found in abundance in the brushes from the M'Leay River to Cape York.

29. *Helicia Ternifolia:* Ferd. Mueller.—A small-sized tree, found in the thick brushes on the Richmond and Tweed rivers, where it is called by the colonists *Nut Tree*.*

30. *Dysoxylon Rufum :* Benth.—*Rosewood* of the Colonists.—A tree of large size, found on all the rivers of the coast of New South Wales. Used for making furniture.

31. *Stenocarpus Sinuosus:* Endlicher.—This is a very handsome tree, of moderate size, plentiful in the thick brushes on the Richmond and Tweed rivers.

32. *Elaeocarpus Grandis :* Ferd. Mueller.—A tree attaining a very large size, found in the thick brushes on all the rivers north of the Clarence, on the east coast of New South Wales.

33. *Akania Hillii:* J. Hooker.—A handsome tree of small size, found in the thick brushes on all the rivers on the east coast of New South Wales, from the Manning to the Tweed rivers.

34. *Helicia Praealta:* Ferd. Mueller.—A moderate-sized tree, found in the thick brushes on the Clarence and Richmond rivers. Wood used by coopers.

35. *Cedrela Taona:* Roxburgh—*Red Cedar* of the Colonists.—Found in all brush forests on the coast of New South Wales, on the Richmond, Bellinger, and Tweed rivers. This wood is yet obtainable in considerable quantity, but will soon become a scarce article, as it is not to be procured of any size from other localities than those indicated.

36. *Grevillea Robusta :* A. Cunningham—*Silky Oak* of the colonists.—This tree attains a considerable size, and is found in the brushes on the east coast of Australia, from the Clarence River to Cape York. Wood used by coopers, wherever it can be obtained.

37. *Cinnamomum Camphora :* F. Nees—*Camphor-Tree*.—Grown in the Botanic Gardens, Sydney.

39. *Rhus Rhodanthema :* Ferd. Mueller—*Light Yellowwood*.—A tree attaining a considerable size in the brush forests on the Richmond River. Timber sometimes used for cabinet-work.

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* The seeds are edible, according to Walt. Hill, Esq. They resemble those of the Chilian Guevina.

QUEENSLAND TIMBER.

INTRODUCTORY REMARKS.

The species of timber trees of New South Wales far exceed in number those of Victoria, while again those of Queensland surpass considerably the number of the trees of New South Wales. The wood collection formed in Queensland represents but a small share of the species obtainable from the rich vegetation of its wide colonial territory, and the specimens submitted to the jurors are again but a portion of the series originally transmitted; but as of many no duplicates were extant, the withdrawal of a full collection from the Victorian Exhibition for timely shipment to Paris left many species unrepresented; the Jurors, therefore, can refer now only to such woods as are left. These consist of two principal collections, one formed by Walter Hill, Esq., on behalf of the Royal Commission of Brisbane, in the vicinity of that city; the other by A. Thozet, Esq., on behalf of the Local Exhibition Committee of Rockhampton. The one collection presents, therefore, the southern species, the other the more northern kinds of woods. Some specimens of timber not occurring at either place have been contributed by Dr. Mueller, and these represent trees from Cooper's Creek and the Paroo, and others from the vicinity of Rockingham's Bay, in the far north. The collection is phytographically named, with the exception of a small share of specimens of which no corresponding objects for botanical reference were available. The majority of woods represent jungle plants, and they are all in a certain measure indicative of the climate of the corresponding districts. They are, in the majority of cases, allied to those of trees which we are accustomed to see in the moist tropical jungles of India. These trees, while so manifold in variety, can thus likewise be applied to purposes equally manifold; but they are generally not so gregarious as many of our southern timber-trees. In the jungle, none ever predominantly constitutes the main bulk of the forest; and what in the more northern part of Australia is gained by the superb magnificence and extraordinary diversity of the trees, is recompensed in the south by the extreme copiousness of few species. Yet these also can be drawn into very many important uses, and by their vast preponderance afford great facilities for supplying material to factories on a most extensive scale. This observation to a certain extent holds good also to the open, and especially more interior parts of East Australia (whether Queensland or New South Wales), where from the rises of the coast ranges, westward chiefly, a monotony of tree-vegetation of eucalyptus, and in lesser degree of acacia, re-occurs. Many of the East Australian jungle-trees have been only of late drawn within the precincts of science—some even only on this occasion. On systematically scientific names sole reliance has therefore been placed; and it is to be hoped that, should ever special vernacular names be bestowed on these woods, the selection of appellations will be made with such care as will guard against any further extension of that ambiguity and confusion which renders true discrimination of the various Australian woods already, in most instances, by popular language an impossibility.

NOTES ON SOME OF THE WOOD SPECIMENS FROM SOUTHERN QUEENSLAND.

By Walter Hill, Esq., Director of the Botanical Gardens, Brisbane.

13. *Flindersia Schottiana:* F. Mueller.—Stem 12 to 16 inches diameter; 60 to 70 feet high. This species occurs plentifully in the scrub near the coast. It is of slender growth. The wood is soft, and soon perishes when exposed.

45. *Owenia venosa:* F. Mueller.—*Sour Plum;* 8 to 12 inches diameter; 20 to 30 feet high. A fine shady tree, common in scrubs. The wood is hard, of a reddish colour, and its great strength renders it fit for wheel-wright work.

82. *Melia Azedarach L.; White Cedar.*—24 to 30 inches diameter; 40 to 60 feet high. A nice deciduous tree. The wood is soft, and not considered of any value.

153. *Spondias pleiogyna:* F. Mueller.—*Sweet Plum;* 20 to 45 inches diameter; 70 to 100 feet high. A beautiful tree, having a cylindrical erect trunk, growing sometimes 80 feet in height without branches. It has a rich dark glossy green pinnate foliage, and the wood is hard and heavy, dark red, finely marked, and susceptible of a high polish.

48. *Harpullia pendula:* Planch. — *Tulipwood;* 14 to 24 inches diameter; 50 to 80 feet high. A beautiful growing tree, with glossy green pinnate leaves; found in great abundance on the banks of rivers. The wood has a firm fine texture, and is curiously veined in colouring. It is much esteemed for cabinetwork.

97. *Cupania anacardioides:* A. Rich.—18 to 24 inches diameter; 30 to 50 feet high. A moderate-sized tree, but the wood is not appreciated.

103. *Cupania nervosa:* F. Mueller.—12 to 20 inches diameter; 30 to 45 feet high. The wood of this tree is nicely grained.

79. *Bursaria spinosa:* Cavan.—6 to 9 inches diameter; 20 to 30 feet high. A slender tree, growing in the borders of scrubs, some distance from the sea. The timber is hard, of a close texture, and admits of a good polish.

125. *Bursaria spinosa:* Cavan.—6 to 9 inches diameter; 20 to 30 feet high. The grain is white and close.

30. *Acacia pendula:* A. Cunn.—*Weeping Myall;* 6 to 12 inches diameter; 20 to 30 feet high. A graceful tree, small, with pendant foliage. The wood is hard, possessing a close texture, and a rich dark colour. From Mr. Coxen, in the neighbourhood of Dalby.

91. *Barklya syringifolia:* Ferd. Mueller.—12 to 15 inches diameter; 40 to 50 feet high. This is a most beautiful tree, with dense bright-green glossy foliage. It is common; the wood hard and close-grained.

112. *Erythrina vespertilio:* Benth.—*Cork-tree;* 12 to 25 inches diameter; 30 to 40 feet high. A beautiful tree when in flower. The wood is soft, and is used by the aborigines for making war-shields.

146. *Bauhinia Hookeri:* Ferd. Mueller.—10 to 20 inches diameter; 30 to 40 feet high. An ornamental spreading tree, with pale-green rich foliage. The wood is heavy, and of a dark reddish hue. Presented by H. Miller, Esq.

73. *Backhousia citriodora :* Ferd. Mueller.—9 to 12 inches diameter; 18 to 20 feet high.

43. *Phyllanthus Ferdinandi :* J. Mueller.—12 to 24 inches diameter; 50 to 60 feet high. A beautiful tree; common on the banks of creeks and rivers.

47. *Excœcaria Agallocha, L.—Poison Tree;* 12 to 14 inches diameter; 40 to 50 feet high. A slender tree, resembling some of the fig species in appearance of the foliage. It is frequently met with in the scrub. The wood is hard, and fine grained. The juice is white and nauseous; a single drop falling into the eye will injure the sight.

49. *Sarcocephalus cordatus Miq.—Leichhardt's Tree;* 24 to 36 inches diameter; 60 to 80 feet high. A splendid erect shady tree, with dark-green broad foliage. The wood is soft, but close grained, of a light colour, and easily worked.

21. *Eremophila Mitchelli :* Benth.—*Sandal Wood;* 9 to 12 inches diameter; 20 to 30 feet high.—The wood is very hard, beautifully grained, and very fragrant. It will turn out handsome veneers for the cabinet-maker. From Mr. C. Coxen, in the neighbourhood of Dalby.

78. *Maba obovata : R. Br.*—10 to 15 inches diameter; 30 to 50 feet high. A small tree, frequently to be seen in the Rosewood scrubs. The timber is hard, fine grained, and likely to be useful for cabinet work.

129. *Cargillia Australis : R. Br.*—18 to 24 inches diameter; 60 to 80 feet high. A slender-growing tree, with elongated trunk, and elegant rigid foliage. The grain is close, very tough and fine, of little beauty, but likely to be useful for many purposes.

5. *Podocarpus elata : R. Br.—A Pine;* 24 to 36 inches diameter; 50 to 80 feet high. A very beautiful tree, with elongated cylindrical trunk. It occurs very frequently in the scrubs along the coast. The wood is hard, fine-grained, flexible, and elastic.

15. *Stenocarpus sinuosus :* Endlicher—*Tulip Tree,* 18 to 24 inches diameter, 40 to 60 feet high. This is a most beautiful tree, on account of its clean growth and large pinnatified foliage. It occurs often in the scrubs some distance from the coast. This wood is very nicely marked, and would admit of a good polish.

18. *Exocarpus latifolia : R. Br.—Broad-leaved Cherry,* 6 to 9 inches diameter, 10 to 16 feet high. A beautiful small tree, with scaly black-coloured bark. The wood very hard and fragrant. Excellent for cabinet work.

26. *Morus calcar Galli :* A. Cunn.—*Cockspur Thorn,* 3 to 4 inches diameter, 20 to 80 feet high. A rambling thorny shrub. Duramen dark yellow colour, hard, and used in dyeing yellow and brown.

NOTE.—A public record of acknowledgment is due to Messrs. Anderson and Wright for having caused the Victorian timber to be cut gratuitously into the required sizes for the Exhibition.

BRIEF NOTES ON THE GEOGRAPHICAL DISTRIBUTION OF THE TREES, OF WHICH TIMBER IS EXTANT IN THE SOUTH AND NORTH QUEENSLAND DIVISION OF THE INTERCOLONIAL EXHIBITION.

By Ferd. Mueller, M.D., F.R.S.

[The matter which is printed in smaller type emanated from A. Thozet, Esq., the gentleman who so carefully collected the timber at Rockhampton.]

1. *Polyalthia Nitidissima :* Benth.—A rather gigantic tree, when considered as representative of the order of *Anoneæ.* It ranges through the whole of the littoral forest tract of Queensland.

1. *Polyalthia Nitidissima :* Benth.—*Anonaceæ* (Aboriginal name, Pankalville).—4 to 10 inches in diameter; 30 to 60 feet high. Trunk erect, graceful; pyramidal head; leaves shining; wood white, soft, and pliable; found in scrubs and beds of creeks.

2. *Bursaria Spinosa:* Cavanilles.—Dispersed over nearly the whole Australian continent; common also in Tasmania.

3. *Pittosporum Rhombifolium :* All. Cunningham.—In the coast forests of the northern part of New South Wales and the southern part of Queensland.

21. *Pittosporum Rhombifolium :* All. Cunningham—*Pittosporaceæ.*—6 to 12 ; 50 to 80. A very erect scrub tree; bark whitish and smooth ; the wood of a uniform white colour; when fresh cut emits a very agreeable delicate odour, not unlike mignonette.

4. *Pittosporum Ovatifolium :* Ferd. Mueller.—A tree of fair size, ranging from the extreme north of Queensland considerably southward.

20. *Pittosporum Ovatifolium :* Ferd. Mueller—*Pittosporaceæ* (Konawareu).—4 to 8; 20 to 35. A small tree, met with on creeks and occasionally in scrubs; flowers fragrant.

5. *Citriobatus Megacarpus :* Ferd. Mueller.—Never a large, occasionally a small tree, but usually a shrub. In many of the Brigalow scrubs of Queensland.

19. *Citriobatus Pauciflorus :* All. Cunningham—*Pittosporaceæ* (Karry).—4 to 6 to 15. An ornamental, prickly shrub, of a spherical growth, and white fragrant flowers; trunk short; wood hard and tough; takes a good polish. Will answer admirably in a garden for edgings of borders.

6. *Scolopia Brownii :* Ferd. Mueller.—Dispersed through the whole moist littoral forest tract of New South Wales and Queensland.

7. *Busbeckia Mitchellii :* Ferd. Mueller.—In the Brigalow scrubs, and also in some of the desert tracks of South Australia, Victoria, New South Wales, Queensland, and North Australia.

8. *Flindersia Schottiana:* Ferd. Mueller.—This tree extends from the northern parts of New South Wales to the vicinity of Rockingham Bay. It is confined to forest gullies.

9. *Owenia Acidula :* Ferd. Mueller.—In the Brigalow scrubs of Queensland and New South Wales.

10. *Owenia Venosa :* Ferd. Mueller.—In the more open forest regions of Queensland.

15. *Owenia Venosa :* Ferd. Mueller—*Meliaceæ; Sour Plum* (Pyddharr).—12 to 25; 50 to 70. A fine shady tree with pinnated leaves, on winged petioles; wood hard, of a rose colour. Its great strength renders it fit for wheelwrights' work.

11. *Melia Azedarach:* Linne.—A small tree, ranging never very far away

from the coast through North Australia, Queensland, and the northern parts of New South Wales.

17. *Melia Azedarach:* Willd.—*Meliaceæ: White Cedar.*—12 to 16; 30 to 70. This tree is very handsome when in flower; wood soft, sometimes used for staves.

12. *Spondias Pleiogyna:* Ferd. Mueller.—In the less dense forests of Queensland, towards the coast.

14. *Spondias Pleiogyna:* Ferd. Mueller—*Meliaceæ; Sweet Plum* (Orey Rancooran).—A beautiful tree, having a cylindrical, erect trunk, growing sometimes 80 feet in height, without branches; fine dark green glossy foliage; wood hard and heavy, of a dark red-brown colour, finely marked; takes a very high polish.

13. *Xanthoxylon Brachyacanthum:* Ferd. Mueller.—In most of the jungles of Queensland and of the northern parts of New South Wales.

25. *Xanthoxylon Brachyacanthum:* Ferd. Mueller—*Rutaceæ* (Merrivi).—3 to 8; 30 to 80. A tall, slender, prickly tree; wood close-grained, bright yellow, nicely marked. Will answer for veneering.

14. *Ailantus Imberbiflora:* Ferd Mueller.—Queensland, about the tropic of Capricorn, towards the coast.

26. *Ailantus Imberbiflora:* Ferd. Mueller—*Simarubuæ.*—A large, noble, cylindrical, erect tree, branchy towards the top; flowers fragrant in racemes; would be very ornamental in a plantation. From wounds made in the bark a resinous substance exudes, which burns with a brilliant flame. Found in dense scrubs. Wood light, soft, and appears to be of little durability.

15. *Geijera Salicifolia:* Schott.—In more or less open forests as well of Queensland as of New South Wales.

23. *Geijera Salicifolia:* Schott—*Rutaceæ* (Koko).—4 to 12; 20 to 35. Found growing at the edge of scrubs, on poor sandy soil; bark almost smooth.

16. *Acronychia Laevis:* Forster.—In the moist forests from East Gippsland through New South Wales and Queensland, to the north coast.

16*b*. *Pagetia Medicinalis*: Ferd. Mueller.—As yet only found in the forests around Rockhampton.

17. *Atalaya Hemiglauca:* Ferd. Mueller.—A small tree of the Brigalow scrubs of Queensland and New South Wales.

8. *Atalaya Hemiglauca:* Ferd. Mueller—*Sapindaceæ.*—4 to 12; 15 to 25. Found in open forests, generally on poor soil; wood not durable.

18. *Cupania Anacardioides:* A. Richard.—Widely dispersed through the littoral forest tracts of New South Wales, Queensland, and North Australia.

9. *Cupania Anacardioides:* Richard—*Sapindaceæ.*—6 to 15; 50 to 80. A tree often met with in scrubs; beautiful pinnated leaves.

19. *Cupania Xylocarpa:* All. Cunningham.—A tree widely dispersed through the moister forest regions of New South Wales and Queensland.

11. *Cupania Xylocarpa:* A. Cunningham—*Sapindaceæ.*—12 to 24; 50 to 70. A scrub tree, with smooth bark, branching high. May prove useful for wheelwrights' work.

20. *Cupania Nervosa:* Ferd. Mueller.—In many of the jungles of New South Wales and Queensland.

10. *Cupania Nervosa:* Ferd. Mueller.—*Sapindaceæ; Spurious Beech.*—6 to 12; 30 to 40. Wood very tough and durable, used for stock-whip handles; growing in groups in open forests, also in scrubs.

21. *Harpullia Pendula:* Planchon.—In many of the denser forests of New South Wales and Queensland.

7. *Harpullia Pendula:* Planchon—*Sapindaceæ; Tulip-wood.*—6 to 15; 30 to 50. This fine scrub tree has pinnated light green leaves; wood soft, easily worked.

22. *Sterculia Quadrifida:* R. Brown.—In the coast jungles of North Australia, Queensland, and the northern part of New South Wales.

3. *Sterculia Quadrifida:* R. Brown.—*Sterculiaceæ* (Convavola).—6 to 24; 20 to 40. Found in scrubs and creeks; wood soft, spongy; soon rots.

23. *Elæocarpus Obovatus:* Don.—Occurs in many of the moist forest tracts of New South Wales and Queensland.

4. *Elæocarpus obovatus;* G. Don.—*Tiliaceæ.*—6 to 15; 50 to 70. A tall tree, of common occurrence in dense scrubs; wood close-grained and tough.

24. *Phyllanthus Ferdinandi:* J. Mueller.—Not rare in the brushwoods of New South Wales and South Queensland.

25. *Excæcaria Agallocha:* Linne.—A tree of the jungles of Queensland and North Australia.

85. *Excæcaria Agallacha:* Linne.—*Euphorbiaceæ; River Poisonous Tree* (Balavola Karping).—12 to 30; 40 to 70. Found bordering the estuaries of saltwater rivers and creeks; produces by incision in the bark an acrid, milky juice, which is so volatile that nobody, however careful, can gather a quarter of a pint without being affected. The symptoms are an acrid burning sensation in the throat, sore eyes and headache; a single drop falling into the eyes it is believed will cause loss of sight. The natives of Cleveland Bay use this poisonous juice to cure certain ulcerous chronic diseases (Murrell's testimony). Wood light, white, and soft; will answer for carving and marqueterie.

26. *Mallotus Phillippinensis:* J. Mueller.—Not rare in the coast forests of Queensland, and of the Northern part of New South Wales.

84. *Mallotus Phillippinensis:* J. Mueller—*Euphorbiaceæ.*—6 to 15; 30 to 40. A scrub tree; wood close-grained and tough.

27. *Rhamnus Vitiensis;* Bentham.—Scantily occurring in the east part of Queensland.

32. *Rhamnus Vitiensis:* Bentham—*Rhamnaceæ* (Murtilam).—6 to 12; 30 to 40. Scrub tree; trunk and branches whitish, very smooth; berries quarter-inch in diameter; wood close-grained, of a light reddish and pink colour; may be useful for engraving.

28. *Siphonodon Australis:* Bentham.—In the jungle forests of the northern parts of New South Wales and the southern parts of Queensland.

31. *Siphonodon Australis:* Bentham—*Celastrineæ* (Umpurr).—12 to 24; 60 to 80. A tall scrub tree, trunk 40 to 60 feet clear; branches short, tortuous; compactly arranged in a short pyramidal head; wood close-grained, of a uniform yellowish colour, taking a good polish.

29. *Elæodendron Melanocarpum:* Ferd. Mueller.—In the more open parts of the littoral forests of Queensland.

30. *Elæodendron Melanocarpum:* Ferd. Mueller—*Celastrineæ* (Korawal).—4 to 10; 40 to 60. A slender, erect tree, in scrubs; not very abundant.

30. *Acacia Harpophylla:* Ferd. Mueller.—As yet only known from capricornic eastern Australia.

34. *Acacia Harpophylla:* Ferd. Mueller—*Leguminosæ*—Brigalow (Orkor).—An erect, tall tree; very abundant; branchy towards the top; covers large tracts of the rich scrub lands of Middle Queensland, giving a singular appearance to the forest scenery; wood hard, heavy, close-grained, and of a dark-pale colour, giving a strong odour of violets. In use for building purposes. The aboriginals make with it almost all their boomerangs, spears, and clubs.

31. *Acacia Julifera:* Bentham.—In many of the littoral regions of Queensland.

35. *Acacia Julifera:* Benth—*Leguminosæ.*—4 to 10; 20 to 30. A small tree, generally found growing in poor soil; wood prettily marked, easily worked.

32. *Acacia Macradenia:* Bentham.—In the coast and inland tracts of Queensland, about the tropic of Capricorn.

39. *Acacia Macradenia:* Bentham—*Myall* (Toney).—12 to 18; 30 to 50. In scrubs and open forests; beautiful black, hard, and close-grained wood, taking a very high polish.

33. *Acacia Pendula:* All. Cunningham.—In the interior districts of New South Wales and Queensland.

34. *Acacia Salicina:* Lindley.—Occurring in the depressed scrubby interior regions of the whole Australian continent.

37. *Acacia Salicina:* Lindley—*Leguminosæ* (Bakka).—6 to 12; 20 to 40. This is mentioned by Sir Thomas Mitchell as the tree, the bark of which is, from its deleterious properties, used by the natives of New South Wales for poisoning fish in small lagoons. It is used in the Fitzroy River for a like purpose by the natives. Wood dark and pretty; easy to work.

35. *Acacia Bidwillii:* Bentham.—In various parts of Queensland, more particularly towards the coast.

38. *Acacia Bidwilli;* Bentham—*Leguminosæ; Bidwill's Acacia* (Waneu).—4 to 8; 20 to 30. In ridges and plains; wood coarse, soft, and not durable.

36. *Pithecolobium canescens:* Ferd. Mueller.—In Queensland, about the tropic of Capricorn.

42. *Pithecolobium Canescens:* Ferd. Mueller—*Leguminosæ* (Walkor).—10 to 24; 30 to 50. An ornamental tree; flowers yellow. The sap of this wood is of a light-yellow colour, wood not unlike cedar towards the centre, but harder; very much prized by cabinetmakers.

37. *Pithecolobium Thozetianum:* Ferd. Mueller.—In the forests of Queensland, about the tropic of Capricorn.

43. *Pithecolobium Thozetianum:* Ferd. Mueller—*Leguminosæ.*—12 to 30; 40 to 60. A tree of common occurrence in stony scrubs; trunk erect, with a thin whitish bark; very branchy and shady towards the top; wood very hard, heavy, tough, and close-grained; may prove useful for gig shafts.

38. *Pithecolobium pruinosum:* Bentham.—In most of the jungles of New South Wales, and also in the south of Queensland.

47. *Pithecolobium Pruinosum:* Bentham—*Leguminosæ* (Talingora).—4 to 15; 30 to 50. A small scrub tree, generally with many stems; branches and flowers of a rusty colour; wood soft, not durable.

39. *Bauhinia Hookeri:* Ferd. Mueller.—Widely distributed through the forest regions of Queensland,

45. *Bauhinia Hookeri:* Ferd. Mueller—*Leguminosæ; Mountain Ebony* (Warwor).—10 to 24; 30 to 40. An ornamental spreading tree, with pale-green, handsome, deciduous foliage, and bearing large white flowers of sweet perfume; wood supple and heavy, of a dark-reddish hue; will answer well for veneering.

40. *Bauhinia Leichhardtii:* Ferd. Mueller.—In the desert-interior of South Australia, New South Wales, Queensland, and North Australia.

41. *Barklya Syringifolia:* Ferd. Mueller.—In the jungles of several parts of Queensland.

44. *Barklya Syringifolia:* Ferd. Mueller—*Leguminosæ.*—4 to 8; 20 to 30. A handsome scrub tree, with large, cordate, shining leaves; flowers a bright yellow.

42. *Erythrina Vespertilio:* Bentham.—Rather frequent in Central and North Australia, Queensland, and in the most northern parts of New South Wales.

46. *Erythrina Vespertilio:* Bentham—*Leguminosæ; Coral Tree* (Wotheugn).—12 to 30; 30 to 50. A graceful deciduous open forest tree; very abundant; branches prickly; flowers bright red in racemes, and formed before the leaves show; wood soft, very light when dry; used by the aboriginals for making their shields. The dry logs of the dead trees are also used by them as a means of fording large rivers or creeks.

43. *Eucalyptus Rostrata:* Schlecht.—Dispersed over river flats and along banks of streams throughout nearly the whole of Australia, but seemingly not occurring in Tasmania. It is the "Red Gumtree" of East Australia, but not of West Australia.

44. *Eucalyptus Microtheca:* Ferd. Mueller.—Widely dispersed through the more central regions of the continent.

53. *Eucalyptus Microtheca:* Ferd. Mueller—*Black Box* (Koloneu).—24 to 120; 100 to 180. This tree, abundant in rich alluvial scrub land, can be considered the giant of our tropical forests. The bark black, slightly fissurated and persistent on

the whole length of the trunk, becoming smooth and ash-coloured in the branches; wood with figures not unlike walnut, but darker, heavier, and closer-grained. Piles made of the young trees have been used with advantage for the construction of the Great Northern Railway.

45. *Eucalyptus Citriodora:* Hooker.—Not common in some of the open forests of New South Wales and Queensland.

52. *Eucalyptus Citriodora:* Hooker—*Myrtaceæ; Citron-scented Gum* (Kangar).—12 to 13; 50 to 80. This tree is not often met with on ridges along the eastern coasts of Australia; bark ash-coloured and smooth; wood easily worked.

46. *Lumnitzera Racemosa:* Willd.—In the littoral tracts and the islands of Queensland and North Australia.

50. *Lumnitzera Racemosa:* Willd.—*Combretaceæ* (Karkin).—2 to 6; 10 to 15. A small tree, found within the tidal saltwater in rivers and creeks; the branches and the thick fleshy leaves easily broken; wood prettily marked.

47. *Backhousia Citriodora:* Ferd. Mueller.—In the southern forests of Queensland.

48. *Barringtonia Careya:* Ferd. Mueller.—In the more open forest regions of Queensland and North Australia.

54. *Barringtonia Careya:* Ferd. Mueller—*Barringtoniaceæ; Broad-leaved Apple Tree* (Barror).—A small tree of a crooked growth, but very graceful, with broad leaves and handsome pink and white flowers; found in abundance in rich alluvial soils; wood of a blood-red colour towards the centre; subject to crack; requiring, like some European timber, to be submerged before being worked. According to James Murrell the natives of Cleveland Bay use the bark of the stem for stupefying fish in fresh water, and the bark of the root for the same purpose in salt water.

49. *Terminalia Thozetii:* Bentham.—In the eastern part of Queensland.

49. *Terminalia Thozetii:* Bentham—*Combretaceæ.*—12 to 36; 50 to 90. An erect trunked tree; abundant in scrubs; wood close-grained and tough, of a pale-yellow colour, splitting freely.

50. *Homalium Vitiense:* Bentham.—In the capricornic regions of Queensland.

80. *Homalium Vitiense:* Bentham—*Homaliaceæ.*—12 to 24; 50 to 70. A tree found in scrubs, with erect cylindrical trunk; spreading crooked branches towards the top; wood white, close-grained and durable; may prove useful for wheelwrights' work.

51. *Sarcocephalus Cordatus:* Miquel.—Not rare in the littoral forest tracts of Queensland and North Australia.

57. *Sarcocephalus Cordatus:* Miquel; *Rubiaceæ:* Ferd. Mueller—*Leichhardt's Tree* (Toka).—24 to 40; 60 to 100. A magnificent, erect, shady tree, with dark-green deciduous foliage; handsome, very fragrant, globular flower, and having a bitter-flavoured granulated fruit; wood soft, of a light bright-yellow colour; some varieties of this timber have a beautiful wavy grain; very easily worked; will answer for carving; it has the peculiarity of being difficult to ignite. The trees should be cut in winter, when deprived of their leaves, and submerged, or the timber will be subject to the attack of insects.

52. *Canthium Oleifolium:* Hooker.—Through the Brigalow scrubs and more open forests of the northern part of New South Wales, the whole of Queensland, and North Australia.

56. *Canthium Oleifolium:* Hooker—*Rubiaceæ.*—A shrub met with in poor soil; wood hard and tough.

53. *Brassaia Actinophylla:* Endlicher.—In deep wet forest recesses of Queensland.

55. *Brassaia Actinophylla:* Endlicher—*Araliaceæ; Umbrella Tree* (Pinankaral). 6 to 12; 30 to 40. Leaflets on a common stalk 8 to 12 inches long; handsome, highly ornamental; wood soft, not durable.

54. *Earlia Excelsa:* Ferd. Mueller.—Rare in forests of Queensland, about Capricorn. It is probably the largest tree in the extensive order of *Acanthaceæ.*

75. *Earlia Excelsa:* Ferd. Mueller—*Acanthaceæ.*—3 to 6; 15 to 25. A large and

highly-ornamental shrub, with many stems; small, dark green leaves; flowers tubular, crimson; wood close-grained.

55. *Achras Australis:* R. Brown.—In the woods of the coast-tracts of New South Wales and the southern parts of Queensland.

64. *Achras Pohlmaniana Sapotaceæ:* Baleam.—12 to 20; 40 to 70. A tall scrub tree, with beautiful foliage; bark thin, grey yellowish; wood of a uniform pale yellow colour; close-grained.

55*b*. *Achras Pohlmaniana:* Ferd. Mueller.—East Australia, about Capricorn. Fruit edible.

56. *Maba Obovata:* R. Brown.—In the more open forests, widely distributed through Queensland.

63. *Maba Obovata:* R. Brown.—*Ebenaceæ—Ebony;* (Ronone).—5 to 12; 20 to 30. This tree is very abundant in all scrubs, but does not attain a large size; wood hard and tough; very close-grained, black ebony at the heart; sap white and pink. Used for mallet and chisel handles.

57. *Cargillia Australis:* R. Brown.—In the forest regions towards the coast through New South Wales and Queensland.

62. *Cargillia Australis:* R. Brown.—*Ebenaceæ.*—A small tree found in scrubs.

58. *Eremophila Bignoniflora:* Ferd. Mueller.—In the Brigalow scrubs of New South Wales and Queensland.

72. *Eremophila Bignoniflora:* Ferd. Mueller.—*Myoporinæ;* (Pombel).—6 to 24; 30 to 35. A tree generally with many stems of irregular growth; wood hard, fragrant, and most elegantly marked with green and yellowish figures; takes a high polish.

59. *Eremophila Mitchellii:* Bentham.—In the Brigalow scrubs of New South Wales and Queensland.

73. *Eremophila Mitchellii:* Bentham.—*Myoporinæ; Bastard Sandalwood* (Balvory).—6 to 12; 20 to 30. A small tree, growing in open forest land; wood hard, of brown colour, nicely waved. Owing to a strong aromatic odour, resembling that of sandalwood, furniture made of this timber may be free from the attack of insects.

60. *Vitex Macrophylla:* R. Brown.—In the densest coast forests of most northern parts of Queensland.

61. *Diplanthera tetraphylla, R. Br.*—In the densest coast forests in the remotest north of Queensland.

62. *Chionanthus Effusiflora:* Ferd. Mueller.—In the woods along the coast of Queensland, especially in the more northern parts.

66. *Chionanthus Effusiflora:* Ferd. Mueller—*Oleaceæ* (Eurpa).—6 to 15; 30 to 60. Found in mountains, scrubs, and creeks; wood hard and tough.

63. *Alstonia Constricta:* Ferd. Mueller.—As well in the moist jungles as in the dry Brigalow scrubs of the whole of Queensland and the northern parts of New South Wales. This tree attains a much larger size in the jungles than in the scrubs.

69. *Alstonia Constricta:* Ferd. Mueller—*Apocynaceæ; Fever Bark.*—6 to 15; 40 to 70. Of common occurrence in scrubs, and occasionally in open forests; bark thick, yellow, deeply fissurated, of an intense bitterness. It is said that this bark possesses the same properties as quinine.

64. *Ardisia Pseudo-Jambosa:* Ferd. Mueller.—In the dense forests of Queensland, about the tropic of Capricorn.

65. *Ardisia Pseudo-Jambosa:* Ferd. Mueller.—*Myrsineæ* (Gaon Gaon).—4 to 6; 10 to 25. A shrub or small tree, found in sandy creeks and scrubs, affecting very shady places; fruit globular, crimson, the size of the European cherry; well deserving room in every garden.

65. *Stenocarpus Sinuosus:* Endl.—The tree occurs in the southern parts of Queensland and the northern parts of New South Wales, in forest ravines.

66. *Cardwellia Sublimis:* Ferd. Mueller.—Restricted to the humid most northern forest country of Queensland.

67. *Xylomelum Scottianum:* Ferd. Mueller.—As yet only found in the most remote north-east of Queensland, in forest gullies.

68. *Darlingia Spectatissima:* Ferd. Mueller.—Known only from the most northern part of the east coast of Queensland.

69. *Hakea Stricta:* Ferd. Mueller.—In the deserts of South Australia, Victoria, New South Wales, and the south-west of Queensland.

70. *Grevillea Striata:* R. Brown.—In the dry interior tracts of North and Central Australia, Queensland, and the north of South Australia and of New South Wales.

77. *Grevillea Striata:* R. Brown—*Proteaceæ; Silvery Honeysuckle* (Turraie).—6 to 15; 30 to 50. A tree found scattered on plains and ridges, with narrow, long, striated silvery leaves; wood reddish dark, very curiously marked, easy to work, used for bullock yokes.

71. *Ficus Vesca:* Ferd. Mueller.—On river banks in the more northern parts of Queensland.

92. *Ficus Vesca:* Ferd. Mueller.—*Urticaceæ; Leichhardt's Clustered Figtree* (Parpa). 12 to 36; 40 to 60. Found in scrubs, also on the banks of rivers and creeks; the fruit, which is of a light-red colour when ripe, hangs in clusters along the trunks and on some of the largest branches; timber soft; may answer for packing cases.

72. *Morus Calcar Galli:* A. Cunningham.—In the forests not distant from the coast, in various parts of New South Wales, and of the south of Queensland.

73. *Celtis Ingens:* Ferd. Mueller.—In the jungle forests of Queensland and the northern parts of New South Wales.

94. *Celtis Ingens:* Ferd. Mueller—*Urticaceæ.*—6 to 12; 30 to 50. A middle-sized scrub tree of rare occurrence; wood white, soft, and pliable.

74. *Santalum Lanceolatum:* R. Brown.—Sparingly distributed over North Australia, Central Australia, the northern parts of South Australia, and a large portion of Queensland.

75. *Exocarpus Latifolia:* R. Brown.—In many parts of Queensland and North Australia.

79. *Exocarpus Latifolia:* R. Brown—*Thymeleæ; Broad-leaved Native Cherry* (Oringorin).—6 to 10; 15 to 35. A small scrub tree; bark almost black, scaly; wood hard, with the fragrance of roses; takes a good polish.

76. *Casuarina Tenuissima:* Sieber.—In more open forests, from East Gippsland, through New South Wales to the southern parts of Queensland.

95. *Casuarina Tenuissima:* Sieber—*Casuarineæ; Mountain Oak* (Bureutha).—6 to 15; 30 to 45. On the mountain sides, at an elevation of 1000 feet, this little tree begins to make its appearance; timber close grained, with figures white and pink.

77. *Podocarpus Elata:* R. Brown.—Rather scantily dispersed through the whole littoral tracts of New South Wales and Queensland.

WOOD BOOKS.

Colonel Champ exhibits specimens of Victorian wood, converted into small boxes of book form, according to a design adopted by that gentleman at the Exhibition of 1861, and then suggested by Dr. Mueller. Nothing could be more convenient and more interesting than a library (to speak allegorically) of such imitation books, representing the different timber of different countries, which could be systematically, or alphabetically, or geographically arranged. Australia alone could furnish for such a collection more than a thousand volumes.

BARKS FORWARDED TO THE EXHIBITION BY FERD. MUELLER, M.D.

1. Eugenia Smithii
2. Eucalyptus sp.
3. Banksia serrata
4. Eucalyptus inophloia
5. Acacia subporosa
6. Eucalyptus Stuartiana
7. Eucalyptus longifolia
8. Acacia penninervis
9. Eucalyptus obliqua, and Fibre of
10. Pittosporum undulatum
11. Melaleuca ericifolia

VICTORIAN WOODS MANUFACTURED INTO PAPER KNIVES.

Exhibited for the Commissioners by Dr. Mueller.

Pittosporum undulatum
Atherosperma moschatum
Acacia implexa
Senecio Bedfordii
Myrsine variabilis
Myoporum insulare
Banksia serrata
Acacia melanoxylon
Eucalyptus rostrata
Aster argophyllus
Eucalyptus inophloia
Hedycaria Cunninghamii
Eucalyptus (black butt)
Eucalyptus corymbosa
Leptospermum sp.
Melaleuca squarrosa
Casuarina stricta
Exocarpus cupressiformis
Eucalyptus oleosa
Acacia subporosa
Callitris verrucosa
Panax palmaceus
Pomaderris apetala
Eucalyptus longifolia
Lomatia Fraserii

PRODUCTS OF DRY DISTILLATION OF VICTORIAN WOODS.

In placing before the visitors of the Intercolonial Exhibition the products obtained by dry distillation from a series of the most widely-distributed timber trees of this country, I had a double object in view. I wished to render known new sources of employment for both labour and capital; and I desired likewise to point to inducements hitherto very imperfectly understood, for the occupation of a vast extent of the densely timbered ranges, in which, as yet, no dwelling is to be found. The climate of these free mountains is salubrious, and, indeed, delightful, and the material for lucrative work is accessible in unbounded abundance. While in northern countries the fir, which yields us the Stockholm tar, is so precious as to admit of the selection of roots and branches alone for the purpose of distillation, the stems being needed for the softwood deals which we import, we can here subject, without restrictions dictated by economy and by limited supply in old countries, an infinitely larger mass of wood to industrial processes. While in northern countries the inclemency of the climate renders forest operations for a part of the year surrounded with difficulties, and while the toiling labourer there can but raise a scanty supply of food from the earth, we can in this genial zone call forth in exuberance cereals and other main-

stays of aliment from a grateful soil, and can turn into ever-verdant and never-frozen valleys the pasture animals needed for our local sustenance. Moreover, by the cultivation of many highly valuable plants, excluded from less genial zones, and of such plants as need more humidity and more shelter than our open cereal tracts afford, the paths of prosperity become still more numerous by which families mayseek for their hardy offspring independence and healthy occupation. Thus, they may engage in work which yields for paper-mills the raw material; in the production of tar, acids, and potash, or in the artless distillation of volatile oils; and these occupations may be combined in sheltered glens with the rearing of Chinese tea, Peruvian bark, senna, cork, sumach, perhaps even coffee, and very many other products highly remunerative, while less secluded portions of the ranges, under singular facilities for irrigation, will yield olives, vine, oranges, and an almost endless variety of other fruits.

Wherever, therefore, the miner has vainly searched for the metallic treasures of the soil, we should see, under circumstances so favourable to rural pursuits, the dwellings of families arise. In sketching a hopeful picture of future forest life, I have not thought of Victoria alone. The results of the investigations in some of the new timber resources, here preliminarily placed on record, might readily be a guidance to settlers in the woods in all the surrounding colonies, where most of the trees here experimentally operated on likewise occupy extensive localities not readily accessible to cereal culture or ordinary pastoral pursuits. The primary information furnished on this occasion refers to the yield of tar, wood vinegar, and wood spirits from such of our timber as in all instances as stated are of vast prevalence, and in most cases restricted to barren rises or to swampy depressions.

The percentage of tar, and the strength of the wood vinegar from native timber, as defined in the adjoining table, bears fair comparison with the results attained in other countries from other trees. But for greater facility of comparison, a scale from the yield of some European trees is in juxtaposition annexed. Though there is no great material difference between the tars and vinegars obtained by the heating of various woods under exclusion of air, I found it desirable to exhibit the full series of the products. The wood employed was air-dried, the amount torrefied in each case 25 lbs. The details of the operation were well carried out by Mr. Hoffmann, to whose skill I also entrusted the determination of the percentage of yield of the tar and vinegar, and again the proportion of the wood spirits, acetic acid, and other constituents of the latter. The charcoal remaining as a residue after the torrefication of the wood has also been placed in the Exhibition, to show its texture in each instance, some of the kinds being probably eligible as an ingredient for gunpowder. The quantities of potash have not been ascertained, as I intend to make it ere long a subject of special inquiry. In referring to the tables on these products of dry distillation, it must be remembered that the degree of heat to which the wood is subjected, as well as the degree of rapidity of its action, exercises a modifying influence on the results. Hence the percentage must be regarded as one of approximate calculation only; besides, wood of the same species from different climatic localities will not precisely give the same yield of products and educts. Mr. Hoffmann employed hydrochloric in preference to sulphuric acid in liberating the acetic acid from the lime, a process having several advantages (which here

need not be pointed out) which largely compensate for the somewhat greater cost of that acid. It remains yet to refer, at least cursorily, to the uses to which the products of wood distillation find their principal application. Tar, so extensively needful for naval purposes, and for building structures, might in these southern countries, much more extensively than hitherto, be used for protecting ironworks exposed to the air against oxydation, the application of tar being less costly, more lasting, and often even more sightly, than that of oil-paint. Soft-wood, if coated with eucalyptus-tar, assumes an excellent appearance, and if in ornamental structures a touch of varnish is added, this tar becomes the most eligible article for securing duration. If the production of tar is to be the main object of secluded combustion of wood, the primitive Scandinavian means might be adopted, which involve but little more appliances than burning wood for coals.

The wood vinegar has its manifold applications. It serves for the fabrication of numerous kinds of articles for dyes, for special chemical purposes, and from it acetic acid may be obtained, or a rectified vinegar, applicable to culinary purposes. As Dye-Mordant, a solution of sesqui-acetate of alumina (the so-called red liquor) is largely used in calico printing. The sesqui-acetate and the simple acetate of iron are in quest to effect, connected with ferrocyanid of potassium, blue dyeing for woollen ware, and with various admixtures to produce a variety of colours in dyeing of cotton and silk. The simple acetate of iron yields, with madder (a plant like other dye-plants introduced into Victoria), a violet colour; and with the sesqui-acetate of alumina, brown and black dyes.

The chemical formula of the wood spirit is not identical with that of alcohol, but it is highly valuable as a solvent for resins in the preparation of varnish. It is but right to remark that a large factory, to which timber is floated on the Derwent, near Hobart Town, has commenced the distillation of wood within the last year; and that to Mr. Hugh Gray, of Ballarat, the credit is due of having, for the Exhibition of 1861, prepared tar and wood vinegar from a species of eucalypt, and of having given approximately the percentage. (*Vide Jurors' Report*, 1861, *p.* 20.)

TABLE

SHOWING THE YIELD OF CHARCOAL, CRUDE WOOD VINEGAR, AND UNCONDENSIBLE GASES,

FOR 100 PARTS OF THE DIFFERENT WOODS.

SPECIES OF WOOD										
Systematic Name	Casuarina Quadrivalvis Lab.	Banksia Australis R. Br.	Acacia Melanoxylon R. Br.	Acacia Mollissima Willd.	Melaleuca Ericifolia Sm.	Eucalyptus Leucoxylon F. Muell.	Eucalyptus Rostrata Schl.	Eucalyptus Obliqua l'Herit.	Eucalyptus Globulus Lab.	Angophora Intermedia Cand.
Vernacular Name	Drooping Sheoak.	Common Honeysckl.	Blackwood.	Wattle Acacia.	Swamp Tea Tree.	Ironbark Tree.	Red Gumtree.	Stringybark Tree.	Blue Gumtree.	Spurious Apple Tree.
Charcoal	27·500	29·500	29·250	26·125	27·875	28·500	29·250	29·125	28·750	29·000
Crude Wood Vinegar	42·812	40·062	40·250	44·750	46·000	44·875	41·125	43·750	45·500	43·812
Tar	7·125	6·562	7·062	7·125	6·750	6·312	6·687	6·062	6·250	6·187
Uncondensible Gases	22·563	23·876	23·438	22·000	19·375	20·313	22·938	21·063	19·500	21·001
	100·000	100·000	100·000	100·000	100·000	100·000	100·000	100·000	100·000	100·000

TABLE

SHOWING the amount of pure Hydrated Acetic Acid, the amount in gallons of proof Vinegar of the revenue (Sp. Gr. 1·0085), represented by the Hydrated Acetic Acid, real Wood Spirit, and Wood Vinegar Tar residue contained in the Crude Wood Vinegar, obtained from 100 pounds of the woods; likewise, the measure of the Crude Wood Vinegar and the amount of dry Acetate of Lime it furnished; further, the amount of pure Hydrated Acetic Acid and real Wood Spirit in the Crude Wood Vinegar per cent.

Species of Wood.		Weight of crude Wood Vinegar.	Measure of crude Wood Vinegar in ounces.	Weight of dry Acetate of Lime produced.	Amount of pure Hydrated Acetic Acid.	Amount of proof Vinegar in gallons.	Amount of pure hydrated Acetic Acid in the crude Wood Vinegar per cent.	Amount of real Wood Spirit.	Amount of real Wood Spirit in the crude Wood Vinegar per cent.	Weight of Wood Vinegar Tar residue.
Systematic Name.	Vernacular Name.									
Casuarina Quadrivalvis..	Drooping Sheoak.........	42·812	640	5·31	2·550	4·10	5·956	2·128	4·970	3·687
Banksia Australis	Common Honeysuckle...	40·062	636	5·44	2·264	3·64	5·651	2·111	5·269	3·750
Acacia Melanoxylon......	Blackwood..................	40·250	648	5·50	2·278	3·66	5·659	1·684	4·183	4·250
Acacia Mollissima.........	Wattle Acacia	44·750	664	5·00	1·656	2·66	3·700	2·027	4·529	4·500
Melaleuca Ericifolia......	Swamp Tea Tree	46·000	700	5·12	1·918	3·08	4·169	1·938	4·213	5·625
Eucalyptus Leucoxylon.	Ironbark Tree	44·875	672	3·69	1·442	2·32	3·213	1·596	3·556	3·312
,, Rostrata ...	Red Gumtree..............	41·125	660	4·06	1·126	1·81	2·737	2·017	4·904	3·312
,, Obliqua... ..	Stringybark Tree	43·750	656	3·88	1·155	1·85	2·640	2·069	4·729	4·937
,, Globulus ...	Blue Gumtree	45·500	676	3·94	1·171	1·88	2·573	1·810	3·978	5·312
Angophora Intermedia .	Spurious Apple Tree.....	43·812	664	3·56	1·245	2·00	2·841	1·792	4·090	4·125

TABLE

SHOWING the amount of Crude Wood Vinegar, Empyreumatic Oil and Charcoal obtained from the distillation of the undermentioned (chiefly European) varieties of Wood, calculated for 100 pounds; also, the amount of pure Hydrated Acetic Acid in the Wood Vinegar; and further, the amount of pure Hydrated Acetic Acid in the Wood Vinegar per cent.—*By Stolze.*

SPECIES OF WOOD.		Weight of crude Wood Vinegar.	Amount of pure Hdrated Acetic Acid.	Amount of pure Hydrated Acetic Acid in the Wood Vinegar. per cent.	Weight of Empyreumatic Oil.	Weight of Charcoal.
Systematic Name.	Vernacular Name.					
Betula Alba	White Birch	44·53	4·86	10·92	8·59	24·21
Fagus Sylvatica	Red Beech	43·75	4·69	10·73	9·37	24·21
Tilia Platyphylla	Large-leafed Linden	42·96	4·44	10·33	11·71	22·65
Quercus Robur	Oak	42·96	4·27	9·93	9·37	25·78
Fraxinus Excelsior	Common Ash	46·87	4·09	8·74	8·59	23·43
Æsculus Hippocastanum	Horse Chesnut	46·09	3·75	8·14	10·15	21·87
Populus Dilatata	Lombardy Poplar	46·09	3·66	7·94	8·59	23·43
Populus Alba	White Poplar	46·09	3·57	7·74	7·81	23·43
Prunus Padus	Bird Cherry	43·75	3·21	7·35	7·81	21·87
Salix viminalis	Basket Willow	46·09	3·20	6·95	9·37	21·87
Rhamnus catharticus.	Buckthorn	46·87	3·16	6·75	8·59	21·87
Hæmatoxylon Campechianum	Logwood	44·53	3·09	6·95	9·37	12·5
Alnus glutinosa	Alder	46·09	2·74	5·96	9·37	21·87
Juniperus Communis	Juniper	45·31	2·61	5·76	10·93	22·65
Pinus Abies	White Fir	41·40	2·38	5·76	13·28	21·09
Pinus Sylvestris	Common Pine	42·18	2·34	5·56	11·71	21·87
Juniperus Sabina	Common Savine	43·75	2·34	5·36	11·71	22·65
Pinus picea	Red Fir	39·84	1·97	4·96	14·06	23·43

PAPER MATERIALS.

In a retrospective view on prior discoveries of paper material, it is not easy to ascertain how far substances also attainable beyond Australia may have been tested and even employed. That British true rushes *(Junci)* are eligible, that they contain about 40 per cent. of pulp-substance, and that they form a splendid substitute for rags, is long since ascertained. From this observation and calculation the inference may be drawn that the generality of rushes, sedges, and kindred plants, all allied in structure and texture, may be drawn, under the prospect of similar facility for working and similar yield, into use. This the experiments here instituted prove to be the case. *Carices* and many grasses furnish approximately 30 per cent. fibre, malvaceous plants average 10 to 20 per cent., and not more is obtained from the stalks of beans, peas, hops, buckwheat, potatoes, heather, broom bushes, and many other plants tried. The yield from Victorian material is much larger, moreover the supply infinitely vaster, and locally much less expensively attainable and much easier worked. Besides, the substances just indicated are generally wanted in great agricultural countries

for refertilisation of fields. Nettles produce about 25 per cent. of pulp fibre, fit for a beautiful paper, easily bleached. A main staple for admixture to rag-pulp has been found in pinewood and straw of cereals. The Museum of the Melbourne Botanic Garden possesses samples of writing and printing papers, manufactured in Southern Germany, for which 30 to 40 per cent. of pinewood and 12 to 15 per cent. China-clay have been employed; wrapping paper made of 50 per cent. of pinewood, and tissue paper containing 40 per cent. pinewood; good printing paper obtained by adding 20 per cent. of aspenwood; glazed packing paper containing again 30 per cent. of pinewood; writing paper of superior quality, prepared in France, from 75 per cent. of esparto, and others solely made of that grass; paper prepared in Switzerland from wood solely, and turned out fit for packing and even inferior writing paper, and fair though not elastic millboards; packing paper made in Belgium, and printing paper prepared in Prussia, containing a large proportion of maize straw and the straw of other cereals.

The prior experiments on exclusively Australian material are very limited, as far as the writer is aware. Years ago stringy bark was shipped and tested in Britain, but seems to have borne only the character of fitness for merely coarse and brittle packing paper. Mr. Alexander Tolmer, of Adelaide, eight years ago caused paper to be made of the Australian marshmallow *(Lavatera plebeja)*, and of the sword-rush of the sand-coast *(Lepidosperma gladiatum)*. New Zealand Flax was pointed out as a fitting substance for paper twenty-two years ago. Good paper of an inland *Lepidosperma* rush, not so heavy and bulky as that experimented on by Mr. Tolmer, was prepared by Mr. Newberry, and referred to by the director of the Geological Survey in his last annual report, published in March. Some of the kinds of material now brought in paper-form before the public at the Intercolonial Exhibition were pointed out several years ago, and nearly the whole of the substances now drawn into use and submitted to the jurors were enumerated as eligible by the writer in the earlier part of 1866, in a note furnished on special inquiry to the *Australasian*. The percentage of pulp obtainable from the new paper fibres has not been exactly ascertained in these first, and to a certain extent preliminary, experiments; but, inasmuch as the raw stuff can be gathered in endless quantity, and as it proved evidently rich in pulp, the tabulation of the percentage was reserved for future more extended experiments. With the exception of one of the samples of stringy bark paper, all the kinds sent to the Exhibition were neither subjected to chlorine nor drawn through size. In addition, I would remark that forest regions and coast lines, swamps, and flats subject to inundations, should prominently yield the material for the factory; for on open pastures or otherwise occupied tracts of country, even paper material cannot be harvested for an unlimited period, at the expense of the soil, with impunity. In factories situated in the vicinity of forests, the soda expended in paper manufactures might be profitably regained by evaporation of the ley and calcining it with coal or sawdust. The value of esparto, or sparta, the grass so extensively shipped from the Mediterranean to British paper mills, varies from £5 10s. to £6 per ton. In viewing the immense supply of various kinds of paper material here cheaply available, there is no reason why they should not form, closely pressed, an article of export probably less inflammable than rags; and still more, it may safely be antici-

pated that, together with the consumption of rags in local factories, the new articles indicated will largely enter into the fabrication of paper, the product of Victorian industry.

The increasing scarcity of rags, scraps, and kindred substances has rendered their supply as a main article for paper making more and more inadequate, while the importation of the Esparto-fibre from the Mediterranean countries has likewise failed most fully to supply the augmented want. Hence, a variety of other substances have been tried, but few drawn into use, for the manufacture of especially the coarser kinds of paper; still, even for these, the raw material is in demand, and substitutes for the finer flax and hemp rags have been for some time much in request for the better kinds of writing-paper. Under such circumstances arose, to a great extent, the desire of the late Duke of Newcastle, that throughout the British colonies investigations should be instituted into the adaptabilities of any vegetable substances eligible for paper manufacture and other textile fabrics. In compliance with the request of His Grace, I had for several years carried on inquiries, microscopical as well as technological, in this direction, whenever opportunities offered; and with the recent establishment of a laboratory in the department under my control, I was able to give these researches a practical bearing, and was thereby enabled to place in the Exhibition samples of thirty kinds of paper prepared, at my desire, by Mr. Christian Hoffmann, each kind representing the unmixed fibre of the particular plant operated on. It was not the aim to produce elegant paper, but only to show the crude nature of pressed and dried paper-pulp, without action of bleaching or glutinising substances thereon. In the selection, besides, every kind of material was discarded which could not be obtained in vast abundance, and also all plants were excluded closely allied to others already selected, otherwise the samples of the series could have been largely augmented. It may suffice on this occasion briefly to enumerate what the collection exhibits, to indicate the geographical range of the species operated on, and to point out what allied plants could likewise be drawn into use. I deemed it also desirable to notice briefly the particular use to which in each instance this paper material could be applied.

I.—Paper from Barks.

1. *Eucalyptus Obliqua:* L'Herit.—The *Stringybark Eucalypt* of Victoria, Tasmania, and South Australia.—The paper prepared from the bark of this tree is not merely suited for packing, but also for printing, and even writing. It may also be employed for mill and paste boards. The pulp bleaches readily. I regard it as the most important material drawn on this occasion into use, for be it remembered that this tree covers many of the barren ranges from St. Vincent's Gulf to Gippsland, and that it equally abounds in Tasmania. Its bark, as is well known, is extremely thick and bulky; it moreover separates with the utmost facility, and is hence universally used for thatching rural dwellings in or near the ranges. Indeed, the supply is available by millions of tons. It has been argued that sad inroads would be made into our forests by turning this material as indicated to account; but even the bark left unutilised by the splitters would furnish an enormous supply; and if the sacrifice of small portions of widely-extended forests were brought within

judicious limits by legislative enactments, possibly not any injury could occur; while indeed at present the annually more or less extensive conflagrations of the Stringybark forests destroy an infinitely larger number of trees than ever could sink under the axe of settlers scattered through the mountains. The area within Victoria alone wooded almost exclusively with Stringybark forest extends over many thousand square miles, generally as yet without any habitations. Allied trees, likewise with thick, fibrous bark, occur in West Australia, Queensland, and North Australia, though not so extensively. Other bark may be similarly converted into paper. The whole thick stratum of the bark was employed. It yields readily to mechanical appliances on account of its lax and loose texture, and is also easily acted on by caustic soda for conversion into pulp.

2. *Eucalyptus Rostrata:* Schlechtendal.—The *Red Gumtree* of South-Australia and Victoria (but not of West Australia).—The paper prepared from the bark of this tree proves much coarser than that of the *Eucalyptus obliqua;* the pulp may be either used as admixture to that of packing paper and pasteboards, or in the composition, or perhaps as sole ingredient, for blotting and filtering paper. The species ranges nearly over the whole Australian continent along river flats.

3. *Eucalyptus Amygdalina:* Labillardière.—One of the so-called *Peppermint-trees,* more oily in its foliage than any of its congeners. It extends through the southern and eastern parts of Victoria, the whole of Tasmania, and the southern parts of New South Wales. The inner bark is adapted for the preparation of all kinds of coarser paper.

4. *Eucalyptus Globulus:* Labillardière—The well-known *Blue Gumtree* of Victoria and Tasmania.—Paper prepared from the bark of this tree answers for packing and perhaps for printing.

5. *Eucaylptus Goniocalyx:* Ferd. Mueller—One of the *White Gumtrees,* called in some districts the *Spotted Gumtree.*—It is confined to the more fertile ranges of Victoria and the south of New South Wales. The foliage is rich in volatile oil. The bark yields a good packing paper, but hardly material for any good writing paper.

6. *Eucalyptus Corymbosa:* Smith—The *Bloodwood-tree* of East Australia.—Occurs from the southern part of Queensland to the eastern part of Gippsland. The paper from the bark of this Eucalypt is remarkable for its great firmness. It makes thus a very strong wrapping paper.

7. *Eucalyptus Leucoxylon:* Ferd. Mueller.—This tree passes in various districts under varied names—for instance, it is the *White Gumtree* of St. Vincent's Gulf, the spurious *Ironbark-tree* of some parts of Victoria, and the *Mountain Ash* and *Ironbark-tree* of parts of New South Wales. The bark can be converted into rough packing paper.

8. *Eucalyptus Longifolia:* Link.—The *Woollybutt* of New South Wales and Gippsland.—The fibre of the bark adapted for packing paper.

9. *Eucalyptus Stuartiana:* Ferd. Mueller.—One of the *White Gumtrees* of the eastern parts of South Australia, Victoria, Tasmania, and the south of New South Wales; called, strange to say, the *Appletree,* about Dandenong; the *Water Gumtree* of Tasmania may belong to the same species; it is designated locally with still other names. The bark of this often very big tree furnishes good material for packing paper, and, like others, for pasteboard.

10. *Acacia penninervis:* Sieber.—A tree, not of very large size, extending from South Queensland through New South Wales to East Victoria; of

rather rare occurrence in Tasmania. The bark of this acacia was chosen merely to demonstrate, that also from the bark of very many species of this great genus a rough kind of packing paper can be produced.

11. *Melaleuca ericifolia:* Smith. — The so-called *Swamp-Teatree.* Universal in inundated places and stagnant waters both of the littoral and mountain tracts of south-east Australia and Tasmania. The friable lamellar bark can be converted into an excellent blotting paper—perhaps, also, filtering paper. It is worthy of record that many species of this genus yield a very similar bark, formed of innumerable membranous layers. The most gigantic species of the genus *Melaleuca leucodendron*, which is common in South Asia and tropical Australia, exhibits such a bark, which thus may be turned to account.

II.—Paper from Foliage.

12. *Casuarina quadrivalvis:* Labillardière.—The *Drooping Sheoak.* A common tree of the coast as well as the inland tracts of South Australia, Victoria, Tasmania, and New South Wales. The stringy foliage formed by the cylindrical concrescence of the branchlets with the leaves can be converted into an excellent pulp for packing, and even printing paper and millboard. The mechanical contrivances for preparing the pulp are particularly easy.

13. *Casuarina leptoclada:* Miquel.—The *Erect Sheoak.* Restricted to Victoria and New South Wales. The foliage in its use is akin to that of the former species. Different Casuarinæ occur in the other Australian colonies, in South Asia, and the Pacific Islands, but none of the species has been employed before for paper manufacture, and consequently the investigations instituted in Victoria may be found even of value in a country so anciently industrial as China.

III.—Paper from Grasses, Rushes, and Allied Plants.

14. *Scirpus maritimus:* Linne.—The *Saltmarsh Clubrush.* This plant being almost cosmopolitan, occurs frequently in more or less brackish waters of, at least extra-tropical, Australia. It seems like the following previously not yet tried, or at all events not yet extensively used for paper manufacture, for which it is singularly well adapted, being, like most rushes, so readily converted into pulp. The amount of bleaching material for all these rushes is trifling. It is sufficiently common here to deserve attention, though not so frequent as in Middle Europe. Apparently the paper is firm enough to stand the impressions of type.

15. *Scirpus lacustris:* Linne.—The *Lake Clubrush.* It grows in moist parts nearly all over the globe, and so it is here also frequent in some places. Being of gregarious occurrence, the plant is readily collected. The paper from it is remarkably good, and hence well adapted at least for printing and tissue paper, but probably also for writing.

16. *Cyperus lucidus:* R. Brown.—The *Shining Gallingale*, a rush-like plant, common in many parts of Australia, shown to be adapted both for printing, tissue, and writing paper. All these rush-like plants bleach with great facility.

17. *Cyperus vaginatus:* R. Brown.—The *Sheated Galingale*, one of the most widely and most copiously distributed of the rush-like plants of all

Australia. Its fibre is extraordinarily tough, and accordingly can be formed into a very tenacious paper, which, moreover, proves one of great excellence. The raw material is available by thousands of tons on periodically flooded river flats, swampy depressions, and other moist localities, where a continued harvest of the plant cannot possibly exhaust the soil.

18. *Heleocharis sphacelata:* R. Brown—The *Stout Spikerush.* Abounds in the swamps of South-east Australia and Tasmania. It yields a paper as good for printing as for writing and tissue.

19. *Heleocharis acuta :* R. Brown.—The *Slender Spikerush.* Common in moist ground over a vast extent of Australia. Closely allied to the *Creeping Spikerush* of Middle Europe and other parts of the globe, which, although so frequent, has seemingly never yet been converted into paper. The local experiments here show this and many other cyperaceous plants exquisitely adapted for good printing and tissue paper, and a by no means very inferior writing paper. Better appliances will necessarily improve on the quality of the paper.

20. *Lepidosperma gladiatum :* Labillardière.—The *Sword-Rush* of the coast. A plant everywhere to be found on the sandy shores, where it greatly tends to bind the shifting sand. It was, nine years ago, subjected by Mr. Tolmer, of Adelaide, to successful tests for paper-fabrication. The article produced from it is of strong texture, and inasmuch as the plant can be collected in enormous quantities on ground not arable, it should find its way deservedly into factories with the many other kinds of material now pointed out. All the species of *Lepidosperma* are of like utility, but not all are equally bulky, nor equally gregarious. It grinds largely into pulp, like many other rushes.

21. *Juncus vaginatus :* R. Brown.—The *Sheated Rush.* Very abundant in moist parts of the whole extra-tropical part of Australia. Resembling several Middle European common rushes, which, like ours, would be worth collecting as material for printing, tissue, and likely also fair writing paper. The pulp is of equability. Many other species could, in the same way, be used.

22. *Xerotes longifolia:* R. Brown.—The *Toothed Dry-Rush.* This plant is dispersed through south-east Australia and Tasmania, and can be employed both for printing and writing paper. It is, however, scarcely so readily collected as many of the other plants just referred to. It has the recommendation of great tenacity for it. Several allied species will yield similar material. The aborigines make baskets from the *Dry-Rush.*

23. *Dichelachne crinita :* J. Hooker.—The *Horsetail-Grass,* one of the toughest of all kinds. It is almost universally diffused over extra-tropical Australia, and occurs also in New Zealand. This grass yields a tenacious paper, especially fit to be used for a thin packing or wrapping paper. Whilst, under disadvantages, working with small quantities of the pulp, the operator found it not needful to separate fragments of the *arista, glumæ,* &c., which appear as an admixture ; but as in this instance it was not the aim to procure an elegant paper, no such provisions which machinery provides were adopted to separate the interspersed particles. It is not unlikely to make fair printing and the less costly kinds of writing and tissue paper.

24. *Stipa semibarbata :* R. Brown.—A grass to be found almost everywhere throughout South-east Australia and Tasmania. The paper from this grass is very substantial, though not so strong as that of the preceding kind. On these two grasses only experiments were made to demonstrate

their adaptability for the purpose in view. There are several other stipæ, besides grasses of other genera, which may finally be introduced with these into factories.

25. *Xanthorrhœa minor :* R. Brown.—This stemless liliaceous plant, of the particular genus which produces the different grass-trees of Australia, extends on temporarily inundated flats with heathy subsoil almost uninterruptedly over very many square miles of country in the Western Port district, Gippsland, and other Victorian localities; there are occasionally lines of from thirty to fifty miles' extent hardly interrupted by any other vegetation. The broad rigid tufts approach each other to the exclusion or gradual suffocation of most other plants of the spot. The harsh foliage, under such circumstances locally available in unlimited quantities, is shown to be easily converted into an excellent printing and also good writing paper; the percentage of pulp is large. This experiment teaches us also, that the wiry leaves of the different grass-trees may all be collected for paper mills, because all have a similar tissue. Thus an ample new resource is opened, especially for West Australia, where various *Xanthorrhœa* abound, and are vernacularly passing by the puzzling appellation of "Blackboys."

26. *Typha augustifolia :* Linn.—The *Bulrush* or *Reedmace*, identical, as it seems, with the common narrow-leaved species of Britain and many other parts of the globe. The pulp of the weighty foliage is easily to be pressed into good printing, tissue, and an acceptable writing paper. So far as I have been able to ascertain, the plant has previously not received any attention in paper factories.

27. *Phormium tenax :* Forster.—The *New Zealand Flax-Lily.* Paper has been placed in the Exhibition from material grown in Victoria. The readiness with which the large richly fibrous leaves can be turned into pulp for a very substantial paper, entitles the plant not alone to our consideration, but also the fact that it may be permanently established with the greatest ease in any swampy ground. At present the limited supply of the *Phormium* reared here is only sufficient to serve as tying material in gardens, vineyards, &c. The adaptation of the *Phormium* for paper-making is not a new one. Mr. Luke Natrads, as early as 1844, exported the New Zealand Flax prepared as raw material for paper, and, I may mention, in the form of square solid lumps, to lessen freight. The subject from that time to the present day has been one of almost constant discussion, and it is to be hoped that a local mill will ere long utilise so excellent a material. The paper here obtained from *Phormium* is the strongest of all.

28. *Confervaceous Algæ*, with *Oedogonium* and other allied freshwater weeds, cohere into extensive teguments on the bottom of our shallow swamps, when during the summer heat the water evaporates. The paper obtained from these *Algæ* would serve well, on account of its strength, for packing. At certain times and in certain localities these waterweeds can be collected in enormous quantity. The application for the purpose appears to be a new one, and was first suggested by Dr. Greeves.

29. *Musa Banksii :* Ferd. Mueller.—In the forest glens of north-east Australia. This plant yields a fair paper for almost all purposes, according to the methods employed in reducing the fibre of the leaves and stalks to pulp. It has, on this occasion, merely been chosen to illustrate that all bananas, and thus the Manilla rope plant, and, besides, numerous allied

products of the vegetable world, might, in tropical countries, be utilised for the preparation of coarser paper. The Banksian banana here operated on was grown in Victoria. The bleaching process, however, is not an easy one. Banana leaves yield approximately forty per cent. of fibre for pulp. The treatment to which these fibres were subjected has been the same as that by which the esparto—or sparta—grass *(Lygeum Spartea)* is reduced to pulp. They were immersed in a solution of caustic soda, obtained from quicklime and common carbonate of soda, varying in strength according to the requirement of the fibre, but always inexpensive. In operating on Victorian raw fibres, it may be of advantage to know that the Mediterranean esparto, which contains about 56 per cent. ligneous fibre, needs application of a caustic liquid, prepared from one-eighth of soda in proportion to the grass. The process of boiling is extended over six or eight hours, whereby oil, albumen, resin, gum, and starch are abstracted. As substitutes for rags, all the materials indicated here deserve preference over many of the articles elsewhere tried or employed. Thus ferns yield generally only from 20 to 25 per cent. of pulp.

GUMS.

Gum, a good deal resembling that of gum arabic, is extant in Mr. Thozet's collection from *Acacia harpophylla* (F.M.), and *Acacia Bidwillii* (Benth.), and in Dr. Mueller's collections from *Acacia pycnantha* (Benth.), *Acacia decurrens* (Willd.), and *Acacia homalophylla* (Cunn.). The number of *arborescent* species of *Acacia* furnishing gum is not inconsiderable. It has been exported for cotton-printing, glueing purposes, and other applications. The species indigenous in Australia are of greater celerity of growth than the African gum-acacias. The supply can be rendered abundant.

PICRIC ACID.

A sample of this substance is placed in the Exhibition, prepared from grass-tree resin in the laboratory of the Botanic Gardens. The importance of the gum-resin of xanthorrhœa for varied industrial purposes had not escaped attention. As early as 1845 varnish was prepared from it, the balsamic fragrance of which is remarkably long retained. In a report presented to the Victorian Parliament in September, 1865, it was pointed out that, among the many gratifying results from bringing native vegetable raw material under notice at the Great Exhibition of 1862, one of the more important had been the general recognition of a large percentage of picric acid in the xanthorrhœa resin, this acid being so extensively used as a yellow dye, and on a basis of indigo for green colour. In some of the western parts of Victoria, and particularly in Gippsland and the Western Port district, the *Xanthorrhœa Australis* abounds on morassy as well as sandy heaths. Other species occur in South Australia, New South Wales, and Queensland, but in West Australia these odd plants form a principal feature in the vegetation—all yield the fragrant resin alluded to, so rich

in picric acid; and in West Australia, therefore, particularly, it ought to become an article of highly-profitable commercial export. Mr. Hoffmann tinged some silks placed in the Exhibition with picric dye, prepared by him in the laboratory of Dr. Mueller's department. The discovery of picric acid in xanthorrhœa resin we owe to Dr. Stenhouse, as early as 1845.

SENNA.

A very fine sample was sent by Mons. Thozet from Rockhampton, where the climate evidently is much more genial for the growth of the different kinds of *Senna-Cassia* than that of Victoria. Nevertheless it is likely, that in the rich soil and in the mild humid air of the fern-tree ranges of Victoria, Senna culture might be pursued as a byework with advantage.

GASTROLOBIUM.

This genus embraces several species highly poisonous, and hence very destructive to sheep, cattle, and horses. In West Australia they are the bane of many pasture tracts, but fortunately in all other parts of Australia only one species is known to exist—*Gastrolobium grandiflorum* (F. M.), which ranges from the Suttor River of Queensland to the rear of Arnhem's Land. This is the species which Mons. Thozet forwarded, with a view that its medicinal properties might be tested, an investigation which is to be conducted conjointly on the West Australian species cultivated in the Botanical Gardens. It is likely that the poisonous principle is strongest in the seeds, as in some leguminous plants. It may, on this occasion, be worthy of record that the *Lotus Australis*, a plant of such wide distribution through this continent, and also occurring in New Caledonia, proves in some tracts unexpectedly highly deleterious, and thus caused vast losses at one season among the flocks in the Lake Torrens regions. Experiments thereon were made by Dr. Eades, Mr. Miscamble, Dr. Mueller, and the late Mr. Angus M'Millan, but it was shown also that the same species gathered on the shores of Port Phillip is inert. It was further shown by Drs. Rudall and Mueller that the cultivated plants of the Darling-river pea (*Swainsona Greyana*, Lindl.), which has such an extraordinarily deleterious effect on stock at certain seasons, was innocuous when given here in large quantity to sheep. The seeds of all these suspicious plants will be subjected to rigorous toxicological and chemical examination at an early period.

The *gastrolobium* scrubs can undoubtedly be destroyed by repeated burning and dissemination of perennial grasses and fodder herbs.

TEA.

Already, during the Melbourne Exhibition in 1861, and the London Exhibition of 1862, Tea from plants of the Botanic Garden was placed before the public, and now again a fair sample is shown. In the Fern-tree

gullies tea plantations are likely to luxuriate quite as much as in the favourable parts of China and in Assam. As an instance of the prolific growth and remunerative yield of this plant in Assam, it may be instanced that from Mimguldye 4000 lbs. of prepared Tea, realised on a plantation of 40 acres, were sent to England last year; the shrubs being planted only in 1863 by a former Victorian colonist, James Daniel Bruce, Esq., the son of Charles Alex. Bruce, who discovered the Assam variety in that locality as a spontaneous plant. The shrubs grew in two years six to eight feet. The Assam wild plant and the Chinese cultivated plant, when crossed, produce a very superior Tea. Both are mere forms of one species.

The only sample in the Exhibition is that prepared in the Melbourne Botanic Gardens from bushes which yielded their product already for the Exhibition of 1861. In the fern-tree gullies, and in other sheltered fertile valleys of our extensive mountain tracts, the plant would still more prosper; and if for the curling process steam rollers were employed, and thus manual labour saved, a new culture industry could be rendered, doubtless, remunerative, while it would give additional employment to the juvenile and infirm of the labouring classes, and a tea of some of the kinds now in ordinary use could be realised from Victorian soil.

SANDARAC.

This resin, of which fine specimens, secured by Mr. Peter Beveridge, from the Murray pine, are placed in the Exhibition, is the exudation of the various species of *Callitris*. The Mediterranean species is not unlike the six or seven Australian species hitherto discovered. In Victoria we have three species of *Callitris*—one rather rare on the coast, a second on generally open mountains, and the third abundant in the many parts of the Murray desert. It is singular that our article has hitherto not attained a standing in commerce.

MYLITTA AUSTRALIS.

A subterranean fungus, to be found in various parts of Victoria and the adjoining colonies. It attains in ordinary cases several pounds weight, but exceptionally it may be found weighing half a cwt.; boiled it becomes edible, hence this truffle has been named by settlers native bread.

GARDENIA RESIN, FROM NEW CADEDONIA.

The species of gardenia yielding this resin remains as yet phytographically unknown. It is probably allied to a species discovered by myself in North Australia, *Gardenia resinosa*, so called on account of its large amount of resinous exudation. The resin from New Caledonia had evidently been fused; it is brittle. On fracture, it presents a yellowish colour; it is tasteless, but possesses an odour reminding of ginger. When leniently heated it assumes a waxy consistence. It dissolves almost without residue in cold alcohol; contains, therefore, only a trifle of

gummy substance. The alcoholic solution is limpid and yellow, rendered milky by addition of water. When dissolved in boiled alcohol, it forms after cooling a large deposit. Evaporation of the spirit leaves a pellucid, greenish-yellow resin. This pure resin dissolves in ether, oil of turpentine, and partly in strong alkaline solutions.

OPIUM.

A trifle of this drug was prepared in the Botanic Gardens, merely to show how with facility this substance might be locally obtained, especially in places where juvenile labour or that of the infirm is to be rendered available. It is almost needless to point out that the clime of Victoria resembles greatly that of the countries from which opium now is mainly obtained.

AROMATIC PLANTS.

In the Queensland Court are leaves of the *Eucalyptus citriodora* (Hooker), a tree to be found in the north of New South Wales and the south of Queensland. The distilled oil forms a superb cosmetic, and the yield is fair. Another lemon-scented tree occurs in the southern forest tracts of Queensland, *Backhausia citriodora* (F. M.), discovered there by Walter Hill, Esq. The leaves of this tree also deserve distillation.

AYAPANA.

Such is the name of a herb yielded by the *Eupatorium triplinerve* of Vahl, or *Eupatorium ayapana* of Ventenat, a plant indigenous to the tropical parts of South America, and now cultivated in many of the warmer parts of the globe. The plant, in a living state, may be seen at the Botanic Gardens of Melbourne. It is pervaded by a highly powerful aromatic odour, emanating from essential oil. Probably to this it principally owes its celebrated virtue of neutralising the effects of snake poison. We have no record to what extent in the more or less intense and diversified manifestations from different snake poisons we can rely on the efficacy of the plant, which may in some respects act like large doses of alcoholic liquids, with so much advantage administered in many cases, and in other respects it may owe its value to the powerful sudorific properties which this herb possesses. Under any circumstances, the *therapeutic* value of the ayapana ought to be subjected to trials, for it holds out great hopes of being of high importance in all cases where, through internal medicines, cutaneous secretion is profusely to be called forth.

CHINESE GRASS-CLOTH.

The plant yielding the fibre for this textile fabric, *Boehmeria nivea*, or the *Rhea* of Eastern Asia, grows vigorously in the Botanical Gardens of

Melbourne. There can be no doubt that among cultivated fibre plants the *Rhea* will assume finally a prominent rank. Fibre has been exhibited grown at Melbourne and at Rockhampton.

NEW SNUFF.

The remarkable sternutatory property of *Myriogyne minuta* and *M. Cunninghami* induced Dr. Mueller to have snuff prepared from them. These weeds grow almost everywhere in this country on moist or occasionally-inundated localities. *Myriogyne minuta* occurs all over Australia, and through a great part of Asia.

BARKS.

All the following were gathered by A. Thozet, Esq., in the vicinity of Rockhampton:—

Bark (as well from the stem as root) *of Alstonia constricta:* F. M.—The *Bitterbark* of Queensland and the north of New South Wales.—This bark seems to have been advantageously drawn into use in cases of intermittent fever, but as yet no published pathologic records exist on the subject. The bark is yielded by a small or middle-sized tree, now and then to be met with in umbrageous forests, as well as in the Brigalow scrubs. It owes its bitterness not to an alkaloid, but, as shown by Mr. Zeyher in Professor Wittstein's laboratory in Munich, to other principles. It is unnecessary to refer further to the subject, since it has been carefully treated in a published memoir. Comparison with other apocynaceous trees throws no light on the specific nature of this bark. In many respects it resembles that of Quassia, unless the resemblance is traced to *Thevetia nereifolia,* which is rather famed in tropical America as a febrifuge, or to *Wrightia antidysenterica,* equally renowned in Ceylon, or the *Alstonia scholaris* of Madagascar and various parts of India and North Queensland, never as yet admitted into general medicine.

Bark of Acacia harpophylla, F. M.; *Croton insulare,* Baill.; *Sarcocephalus cordatus,* Miquel; *Xanthoxylon brachyacanthum,* F. M.; *Bobea putuminosa,* F. M.; *Melodorum Leichhardtii,* Benth.; *Rhamnus Vitiensis,* Benth.—It is expected that all these will serve either as dye stuffs, or for tanning, or for medicinal purposes. Their test will necessarily involve extended researches, which have only commenced. (*Vide* Appendix.)

The bark of *Chionanthus* (Linociera) *picrophloia* is intensely bitter, and it may be administered in intermittent fevers, like that of some other plants of the oleaceous order.

The barks of the following plants yield textile fabrics, but we have as yet no means of calculating whether the expense attending their gathering and preparation stands in proportion to their mercantile value:—*Pipturus propinquus* (Wedd.), a tree ranging from the north of New South Wales through the littoral mountains of Queensland. *Brachychiton populneum* (R. Brown), occurring from the eastern parts of Victoria to the south-western parts of Queensland. *Brachychiton Delabechei* (F.M.), the true bottle tree of the Brigalow scrubs of New South Wales and Queensland.

Abutilon oxycarpum (F. M.), a shrub of various parts of New South Wales and Queensland, and replaced in other parts of Australia by many different kinds of Sida, Abutilon, and other malvaceous plants, yielding likewise textile fabrics; as, for instance, that of *Hibiscus tiliaceus*, which is extensively used in tropical Australia, as well as India, the Pacific groups, and elsewhere, by the natives for fishing-nets, cordage, &c.

BARKS FROM VARIOUS PARTS OF AUSTRALIA.

Pimelea Clavata: (Lab.).—The bark of this shrub was sent by Pemberton Walcott, Esq., of Warren River, West Australia. The species is not unfrequent in that part of Australia. The bark is extremely tough, and largely employed by the natives for their nets, fishing-lines, and kindred objects. The exhibitor is of opinion that the bark could be profitably collected for textile fabrics. If so, it is the only species of sufficiently large and gregarious growth to render the fibre commercially available. A beautiful fibre, of similar utility to the natives of Queensland and to the Yarra tribe, is gained from *Pimelea hypericina* (Cunn.), *Pimelea pauciflora* (R. Br.), and *Pimelea axiflora* (F. M.), all tall species of our forest gullies, the two former occurring likewise in Tasmania. The Murray River natives use the bark of *Pimelea microcephala*, a shrub of the desert.

The numerous Pimeleæ are, perhaps, of greater significance as medicinal plants. The acridity of their bark is more or less analogous to that of *Daphne mezereum;* the bark of *Pimelea stricta* (Meissn.), from St. Vincent's Gulf, being the most acrid of all. The proportion of acrid resin, on which the blistering properties depend, has as yet not been ascertained in any of our species.

TANNERS' MATERIAL.

The inquiries into the value of a series of indigenous substances likely recommendable for tanners' use, instituted in our phytochemical laboratory, have not as yet progressed far, the processes of investigation involving considerable sacrifices of time. It is intended to contrast the percentage of tannic acid contained in barks already in use here with that of many others probably much richer. Besides, it will be of importance to ascertain the extent of tannizing principles of the gum-resins exuded by the various eucalypts, and to tabulate also the relative quantity of tannic acid in many kinds of foliage. In an annexed table the first results are given of the analyses instituted with great care and patience by Mr. C. Hoffmann. Of many eucalypts the resinous exudations may be obtained in rather large quantity and with great convenience. The supply available at the places where the artisans of sawmills or splitters operate is actually boundless. Often the resin is most easily obtained while still in a state of solution, from which it is readily reduced to dryness or concentration. In either form the gum-resin might constitute an extensive article even of export. The following kinds are exhibited:—

1. Gum-resin of *Eucalyptus corymbosa* (Sm.), the Bloodwood tree of Gippsland and New South Wales.
2. Of *Eucalyptus amygdalina* (Labill.), the Messmate tree of some districts of Victoria; also found in Tasmania.

3. Of *Eucalyptus leucoxylon* (F. M.), a tree not uncommon in South Australia, Victoria, and New South Wales.

4. Of *Eucalyptus rostrata*, the Red Gumtree, so universal in Australia. This special kind is preferred to others as a therapeutic astringent, and is particularly administered in Europe and India in cases of diarrhœa which assumed a chronic state. To this category of objects belongs also a sample of Venetian sumach, or scotino, obtained from *Rhus cotinus*, cultivated in the Melbourne Botanic Gardens. There is nothing to prevent this plant being reared here quite as well as on the Mediterranean shores as a dye and tanning article. Tanners' bark, after having served its purpose, might perhaps in some instances be utilised as paper material, and as a source of acetic acid. In reference to this subject, Mr. Hoffmann instances the patent of Mr. A. P. Halliday, of Salford. The coal even is utilised again for steel manufacture, for manure, and for deodorising purposes. Merely to show that the tanning substances could also be employed for writing ink, the bark of *Acacia penninervis* was chosen as a source of tannic acid for the ink exhibited. For black and some other dyes, several of the barks alluded to are available.

TABLE SHOWING THE PERCENTAGE OF TANNIC (TANNIN) AND GALLIC ACID IN THE BARK OF SOME VICTORIAN TREES.

Systematic Name.	Vernacular Name.	Locality.	Tannic Acid.	Gallic Acid.
Eucalyptus Stuartiana	Mountain Ash	Gippsland	4·6	0·7
Eucalyptus Longifolia	Woollybutt	,,	8·3	2·8
Eucalyptus Corymbosa ...	Bloodwood	,,	2·7	0·8
Eucalyptus	Peppermint Tree	,,	20·4	0·8
Eucalyptus	Grey Gumtree	,,	4·9	0·4
Acacia Subporosa	Hickory Acacia	,,	6·6	1·2
Acacia Penninervis	Hardy Acacia	,,	17·9	3·8
Angophora Intermedia ...	Spurious Apple Tree ...	,,	2·9	0·9
Eugenia Smithii	Myrtle Tree	,,	16·9	3·6
Banksia Serrata	Heath Honeysuckle ...	,,	10·3	0·7
Pittosporum Undulatum..	Fragrant Pittosporum.	,,	1·2	0·7
Brachychiton Populneum..	Curryong, or Bottle Tree	,,	2·6	0·6

These proportions are the mean of two closely agreeing analyses, and have in some cases been further corroborated by a third analysis.

LIST OF PREPARATIONS FROM THE PHYTOCHEMICAL LABORATORY OF THE BOTANIC GARDEN.

DESCRIPTION OF SPECIMEN.

WOOD SPIRIT PREPARED FROM WOOD OF—

1. Casuarina quadrivalvis
2. Banksia Australis
3. Acacia melanoxylon
4. Melaleuca ericifolia
5. Acacia mollissima
6. Eucalyptus leucoxylon
7. Do obliqua
8. Do globulus
9. Do rostrata
10. Angophora intermedia

ACETIC ACID PREPARED FROM WOOD OF—

11. Casuarina quadrivalvis
12. Banksia Australis
13. Acacia melanoxylon
14. Melaleuca ericifolia
15. Acacia mollissima
16. Eucalyptus leucoxylon
17. Do obliqua
18. Do globulus
19. Do rostrata
20. Angophora intermedia

TAR PREPARED FROM WOOD OF—

21. Casuarina quadrivalvis
22. Banksia Australis
23. Acacia melanoxylon
24. Melaleuca ericifolia
25. Acacia mollissima
26. Eucalyptus leucoxylon
27. Do obliqua
28. Do globulus
29. Do rostrata
30. Angophora intermedia

CHARCOAL PREPARED FROM WOOD OF—

31. Casuarina quadrivalvis
32. Banksia Australis
33. Acacia melanoxylon
34. Melaleuca ericifolia
35. Acacia mollissima
36. Eucalyptus leucoxylon
37. Do obliqua
38. Do globulus
39. Do rostrata
40. Angophora intermedia.

41. Pure Wood Spirit, prepared from wood of Eucalyptus globulus.
42. Pure Acetic Acid, prepared from wood of Eucalyptus globulus.
43. Grey Acetate of Lime, the "distilled wood-vinegar" employed in its preparation, obtained from wood of E. globulus.
44. A portion of the foregoing preparation purified.
45. Acetate of Soda, prepared from a portion of the sample No. 43.
46. Proto-acetate of Iron. The crude Acetic Acid employed in its preparation obtained from wood of E. globulus.
Samples illustrating the application of the foregoing as a mordant and a dye:—
46a. A piece of woollen material mordanted with a portion of the Proto-acetate of Iron (specimen No. 46).
46b. A piece of cloth mordanted with a portion of the same preparation as the foregoing.
46c. A piece of cloth mordanted with a portion of the Proto-acetate of Iron (specimen No. 46), and finished off with logwood.
46d. A piece of cloth dyed with a portion of the Proto-acetate of Iron (specimen No. 46) and Red Prussiate.
47. Acetate of Peroxide of Iron—Sesqui-acetate of Iron. The acid employed in its preparation derived from the same source as that employed in the preparation of the Proto-acetate.
47. Samples illustrating the application of the foregoing as a mordant.
47a. A piece of woollen material mordanted with a portion of the Sesqui-acetate of Iron (specimen No. 47).
48. Sesqui-acetate of Alumina. Red Liquor. Acetate of Lime employed in its preparation, prepared from Acetic acid, obtained from wood of E. globulus.
Samples illustrating the application of the foregoing as a mordant:—
48a. A piece of cloth mordanted with a portion of the red liquor (specimen No. 48), and dyed with logwood.
48b. A piece of cloth subjected to the same treatment as the foregoing, in which, however, a trifling quantity of magenta has been employed in addition to the logwood.
49. Varnish prepared from the gum-resin of Xanthorrhœa Australis, dissolved in Wood Spirit prepared from wood of E. globulus.
50. Wood Vinegar Tar.
51. Wood Vinegar Tar Residue.
52. Residue left after treatment of the Wood Vinegar Tar Residue with boiling water.
53. Wood coated with some of the Wood Vinegar Tar (specimen No. 50).
54. Wood coated with some of the Tar (specimen No. 28).
55. Wood coated with some of the Xanthorrhœa Varnish (specimen No. 49).
56. Writing Ink, in the making of which the bark of Acacia penninervis has been employed in the place of galls.
57. Tea made from plants growing in the Botanical Gardens.
58. Picric Acid, prepared from the gum-resin of Xanthorrhœa Australis.
Samples illustrating the application of the foregoing as a dye:—
58a. A piece of Silk dyed with some of the Picric Acid (specimen No. 58).
58b. A piece of Silk dyed with some of the Picric Acid (specimen No. 58), and Extract of Indigo.
59. Snuff prepared from Myriogyne minuta.

60. Aqueous extract prepared from the leaves of E. Stuartiana.
61. Essential Oil distilled from the leaves of E. Stuartiana.
62. Paper made from—

1. Stems and leaves of Dichelachne crinita.
2. Bark of Acacia penninervis.
3. Stems of Cyperus vaginatus.
4. Stems of Cyperus lucidus.
5. Leaves of Casuarina leptoclada.
6. Leaves of Casuarina quadrivalvis.
7. Bark of Eucalyptus leucoxylon.
8. Bark of Eucalyptus obliqua.
9. Bark of Eucalyptus obliqua, bleached
10. Bark of Eucalyptus Stuartiana.
11. Bark of Eucalyptus longifolia.
12. Bark of Eucalyptus globulus.
13. Bark of Eucalyptus rostrata.
14. Bark of Eucalyptus goniocalyx.
15. Bark of Eucalyptus amygdalina.
16. Bark of Eucalyptus corymbosa.
17. Stems of Heleocharis sphacelata.
18. Stems of Heleocharis acuta.
19. Stems of Juncus vaginatus.
20. Stems of Lepidosperma gladiatum.
21. Bark of Melaleuca squarrosa.
22. Bark of Melaleuca ericifolia.
23. Leaves of Phormium tenax.
24. Leaves and stems of Stipa semibarbata.
25. Stems of Scirpus lacustris.
26. Stems of Scirpus maritimus.
27. Leaves of Typha augustifolia.
28. Fibre of Oedogonium, &c.
29. Leaves and stems of Xerotes longifolia.
30. Leaves of Xanthorrhœa minor.
31. Bark of Boehmeria nivea, the Chinese grasscloth plant, grown in the Botanic Gardens.

63. Sumach prepared from plants of Rhus Cotinus growing in the Botanical Gardens.
64. Young Fustic, prepared from plants growing in the Botanical Gardens.
65. Opium, from Poppy plants growing in the Botanical Gardens.
66. Extract of Poppy Heads, prepared from plants growing in the Botanical Gardens.

RAW MATERIAL FOR PAPER.

FIBRE FROM BARK OF EUCALYPTUS.

E. Stuartiana.	E. Longifolia.	E. Corymbosa.
E. Obliqua.	E. Amygdalina.	E. Leucoxylon.

VEGETABLES USED FOR FOOD BY THE ABORIGINES.

Two collections occur in the Exhibition. One illustrates the alimentary substances obtained from plants by the natives in the more northern parts of Queensland. This collection owes its existence almost entirely to the strenuous efforts made by M. Thozet to obtain information on the subject, whose elaborate detailed remarks are appended. In cases of emergency even travellers might derive great advantage from the informationthus brought together through that gentleman's intelligent assiduity. The second collection was forwarded by E. M. Officer, Esq., on the Wimmera River. It comprises the following kinds :—Roots of *Arthropodium setosum*, F. M.; *(Dichopogon setosus Kunth); Arthropodium laxum*, Sieb. ; *Geranium dissectum*, L.; *Convolvulus erubescens*, Sims; *Prasophyllum patens*, R. Br.; *Anthericum bulbosum*, R. Br.; *Rumex bidens*, R. Br.; *Microseris Forsteri*, J. Hook. ; *Scirpus maritimus*, L.; *Typha augustifolia*, L.; *Triglochin procerum*, R. Br.; *Lyperanthus nigricans*, R. Br.; *Siebera ericoides*, Benth.; *Diuris palustris*, Lindl.; young roots of *Xanthorrhœa Australis* ; flowers (rich in mellaginous sap) of *Banksia ornata*, F.M.; fruits of *Styphelia adscendens*, R. Br.

There are very many other substances used as edibles by the aboriginals,

but on this occasion only those could come under review which were in reality sent to the Exhibition. The laudable example set to elucidate this subject should be followed up in other parts of Australia before the aboriginal population passes away.

LIST OF SOME OF THE ROOTS AND FRUITS USED AS VEGETABLE FOOD BY THE ABORIGINALS OF NORTHERN QUEENSLAND, AUSTRALIA.—By A. THOZET, Esq.

WITHOUT PREPARATION.

ROOTS.

1. HIBISCUS heterophyllus, Vent. Native Sorrel. *Batham.*—Banks of rivers and creeks, occasionally on plains. A rather tall shrub, part of the stem and young branches covered with small prickles. Leaves entire or lobate. Flower white and pink or yellow, with purple centre. (Roots of young plants, young shoots, and leaves eatable.)

2. BRACHYCHITON platanoides, R. Br. Platan-leaved Bottle-tree. *Ketey.*—In scrub land. A tree of a beautiful pyramidal growth when young, becoming enlarged in the centre with old age. (Roots of young plants eatable.)

3. BRACHYCHITON Delabechei, F. Muell. Bottle-tree. *Binkey.*—Generally in stony scrub land. Remarkable by its enlarged trunk, similar in shape to a lemonade bottle; some measure six to eight feet in diameter. (Roots of the young plants eatable.) The natives refresh themselves with the mucilaginous sweet substance afforded by this tree, as well as make nets of its fibre. They cut holes in its soft trunk, where the water lodges and rots them to the centre, thus forming so many artificial reservoirs. On their hunting excursions afterwards, when thirsty, they tap them one or two feet below the old cuts, and procure an abundant supply.

4. VITIS opaca, F. Muell. Round Yam. *Yaloone* (large); *Wappoo Wappoo* (small).—In clayey soil. Small creepers; leaflets usually three, four, or five, dark green and smooth. Berries black and globular. Tubers very numerous, some weighing five to ten pounds. Eaten in hot weather like water-melons (the small and young are the best); they are, however, difficult to digest. Probably the yam alluded to by Leichhardt; in his "Journal of an Overland Expedition," page 150, he says—"Both tubers and berries had the same pungent taste, but the former contained a watery juice, which was most welcome to our parched mouths."

5. DIOSCOREA punctata, R. Br. Long Yam. *Kowar.*—In scrubs and creeks. A small rough, twining creeper. Leaves heart-shaped and smooth. Flowers terminal. The clusters of the winged capsule look, to an unacquainted observer, like the flowers of the common hop. (Small young tubers eatable.)

6. HELEOCHARIS sphacelata, R. Br. Rush. *Kaya.*—Lagoons, creeks, and ponds. Small, almost spherical tubers, six to twelve on each plant.

STEMS OR FLOWER-STALKS.

7. NYMPHÆA gigantea, Hook. Blue Waterlily. *Yako Kalor* (Rkh. tribe), *Kaooroo* (Clev. B. tribe).—Abundant in all lagoons and ponds. Flower-stalks of the unexpanded flowers, after being broken and deprived of their fibrous part, are eatable.

8. XANTHORRHŒA sp. Grass Tree. *Kono.*—Over ridges and mountain sides. Small part of the extremities of the young shoots, and the white tender base of leaves, eatable.

9. LIVISTONIA Australis, Mart. Cabbage-tree Palm. *Konda.*—In valleys and gorges. 70 to 120 feet in height. (White part of the undeveloped leaves eatable.) "Several of my companions suffered by eating too much of the cabbage palm."—*Leichhardt's Overland Expedition*, page 72.

FRUITS.

10. MELODORUM Leichhardtii, Benth. *Merangara.*—Scrub. A small shrub, sometimes a strong tall creeper. Bark aromatic. Producing in the top of our scrub trees an oblong or almost round fruit, with one or two seeds.

11. CAPPARIS Mitchelli, Lindl. Wild Pomegranate. *Mondo.**—In open plains. A small tree of a very crooked growth. Bark longitudinally fissurated. Trunk and branches covered with short prickles, the branches nearly always drooping. Flowers white. Fruit large, oblong or spherical, 2 to 3 inches in diameter.

12. CAPPARIS canescens, Banks. Native Date. *Mondoleu.*†—In scrub and open forest land. A creeper, ascending shrubs or large trees, with stipulate hooked prickles. Leaves oblong. Flowers white. Fruit pyriform, ½ inch diameter.

13. CAPPARIS nobilis, F. Mueller. Small Native Pomegranate. *Rarum.*—In scrub. A small tree, with prickles on the branches. Leaves oval-oblong. Flowers white. Fruit globular, 1 to 1½ inch in diameter, with a small protuberance at the end. Small, almost spherical tubers, six to twelve in each plant.

14. GREWIA polygama, Roxb. Plain Currant. *Karoom* (Rockh. tribe), *Ouraie* (Clev. Bay tribe).—Among grass. A small shrub. Large, alternate, ovate, serrated leaves. Berries brown and smooth, two or four in an axillary peduncle. Leichhardt speaks of this small plant in his Journal, page 295—"I found a great quantity of ripe Grewia seeds, and on eating many of them it struck me that their slightly acidulated taste, if imparted to water, would make a very good drink; I therefore gathered as many as I could, and boiled them for about an hour; the beverage which they produced was at all events the best which we had tasted on our expedition, and my companions were busy the whole afternoon in gathering and boiling the seeds." The same explorer states also that *à l'instar* of the natives they obtained another good beverage by soaking the blossoms of the tea tree *(Melaleuca leucadendron)*, which were full of honey, in the water used for drinking.

15. SPONDIAS pleiogyna, F. Muell. Sweet Plum. *Rancooran.*—Scrub. A beautiful tree with erect trunk and pinnate glossy leaves. Eatable part *(sarcocarp)* red.

16. RHAMNUS Vitiensis, Benth. *Murtilam.*—Scrub. A tree. Trunk and branches whitish. Leaves very smooth, shining, serrate, crenulate, and green on both sides. Berries ½ inch diameter.

17. ZIZYPHUS jujuba, Lam. Torres Straits Jujube Tree.—The trunk and branches covered with prickles. Leaves ovate, rarely orbicular, green, smooth above, and white tomentose underneath. Fruit ovoid, yellow when ripe, ½ to ¾ inch diameter.

18. RUBUS rosæfolius, Sm. Native Raspberry. *Neram.*—In creeks and valleys.

19. TERMINALIA oblongata, F. Muell. *Yananoleu.*—Scrub and open forest. A large tree, with branches spreading almost horizontally. Spikes a little longer than the leaves, with white yellowish flowers. Fruit purple, flattened and winged.

20. BARRINGTONIA careya, F. Muell. Broad-leaved Apple Tree. *Barror.*—In open forest—alluvial soil. A small tree. Flowers white and pink. Fruit like a middle-sized apple.

21. EUGENIA myrtifolia, Sm. *Buyan Buyan.*—In creeks. Rich bright foliage, with abundant white blossoms. Fruit rose and red, pyriform and drooping.

22. CUCUMIS jucunda, F. Muell. Native Cucumber. *Pumpin.*—On rich alluvial soil and amongst grass. Fruit from ½ an inch to ¾ of an inch in diameter and 1 to 1½ inch in length. The natives bite off one end, press the pulpy substance and seeds into their mouths, and throw away the outer skin or rind, which is very bitter.

23. SARCOCEPHALUS cordatus, Miq. Leichhardt's Tree. *Toka* (Rockh. tribe), *Taberol* (Clev. B. tribe).—Banks of rivers and creeks. Stem erect. Leaves broad, oblong, deciduous. Flowers globular and fragrant. Fruit 1½ to 2 inches diameter, usually spherical, but varying much in shape, very soft when ripe, pulp slightly bitter.

24. TIMONIUS Rumphii, Cand. *Kavor Kavor.*—Beds of creeks. Fruit ½ inch in diameter, in shape not unlike the crab apple of Europe.

25. MABA geminata, R. Br. Scrub box, or ebony. *Ronone.*—In scrub. A small tree, with dark scaly bark. Leaves ovate or obovate, almost sessile. Fruit small, egg-shaped, orange red when ripe.

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* The aboriginal name is given in allusion to the heel of a native, the fruit when ripe resembling that part of the foot.

† Diminutive of *Mondo*.

26. ACHRAS Australis, R. Br. *Baleam.*—In scrub. A tall straight tree. Bark thin, grey yellowish. Leaves obovate, obtuse. Fruit as big as a middle-sized plum, with four or five smooth, shining, flattened seeds.

27. CARISSA ovata, R. Br. Native Scrub Lime. *Karey* (Rockh. tribe), *Ulorin* (Clev. B. tribe).—In scrub. A small prickly shrub. Flowers white, fragrant. Fruit, ½ inch diameter, egg-shaped.

28. MYOPORUM diffusum, R. Br. *Amulla.*—Among grass. A diffuse, almost prostrate, small herbaceous plant. Leaves alternate dentate at their base, lanceolate, acute. Fruit ¼ of an inch diameter, on an axillary solitary peduncle, white and pink when ripe, slightly bitter.

29. EXOCARPUS latifolius, R. Br. Native Cherry. *Oringorin.*—In scrub. A small tree. Bark almost black, scaly. Leaves thick, dark green. Fruit—red when ripe.

30. FICUS aspera, Forster. Rough-leaved Fig-tree. *Noomaie* (Rockh. tribe), *Balemo* (Clev. B. tribe).—In scrubs and plains. Fruit black when ripe.

31. FICUS vesca, F. Mueller. Leichhardt's Clustered Fig-tree. *Parpa.*—In scrubs, banks of rivers and creeks. A good-sized tree. Leaves ovate, lanceolate, acute, dark, smooth, green above, and pale green underneath. The fruit, which is of a light red colour when ripe, hangs in clusters along the trunk, and on some of the largest branches.

32. PIPTURUS propinquus, Wedd. Native Mulberry. *Kongangn.*—In creeks. A soft shrub, almost herbaceous. Leaves broadly ovate, serrate, acuminate, tomentose, and white underneath. Fruit white, transparent.

33. MUSA Banksii, F. Mueller. Native Banana. *Morgogaba* (Clev. B. tribe).

34. PANDANUS pedunculatus, R. Br. Screw Pine. *Kaor.*—Principally on the sea coast. The eatable part is the side of the seeds adhering to the rachis.

SEEDS.

35. NELUMBO nucifera, Gaertn. Pink Water Lily. *Aquaie.*—In lagoons. A splendid aquatic plant. The stalk of the leaves erect; the latter peltate, slightly concave, one or two feet diameter. Flowers pink, five to eight inches diameter. Seeds, 20 to 35; more than three-quarters imbedded in a large flat-topped torus.

(2 *bis*) BRACHYCHITON platanoides, R. Br.

(3 *bis*) BRACHYCHITON Delabechei, Ferd. Mueller.

36. STERCULIA quadrifida, R. Br. *Convavola.*—In scrubs and creeks. Leaves ovate or cordate. The pod, which contains three to six black ovoid seeds, is of a bright crimson colour when ripe.

(7 *bis*) NYMPHÆA gigantea, Hook.

WITH PREPARATION.—BAKED ONLY.

ROOTS.

37. PHASEOLUS Mungo, Linn. *Komin* (Rockh. tribe), *Kadolo* (Clev. B. tribe).—Found slightly twining among grass. Stems and branches hairy. Leaflets 3, narrow, 3 to 4 inches long, acute. Flowers pale yellow. Pod cylindrical, 2 to 4 inches long. Roots the shape of small long carrots.

38. ACACIA Bidwilli, Benth. Bidwill's Acacia. *Waneu.*—Usually in stony ridges. A small tree, prickly when young. Small leaflet 15 to 25 pairs, ⅛ inch long. (Roots of the young plants eatable).

(5 *bis*). DIOSCOREA punctata, R. Br. Large old roots.

(6 *bis*). HELOCHARIS sphacelata, R. Br. The small tubers, baked, are roughly pounded between two stones, and made in the same shape as almond cake.

(7 *ter*). NYMPHÆA gigantea, Hook. The tubers.

39. APONOGETON sp. *Warrumbel* (Rkh. tribe), *Koornabaie* (Cl. B. tribe.)—Shallow water in lagoons and ponds. A small aquatic plant. Leaves oblong, lying on the surface of the water. Rachis erect. Flowers numerous, small, and yellow. Tubers spherical, ½ in. to 1 in. in diameter.

STEMS.

40. DENDROBIUM canaliculatum, R. Br. *Yamberin.*—Very abundant on the decayed trunks and branches, principally of gumtree. (The bulbous stems, after being deprived of the old leaves, are eatable.)

POD.

(36 *bis*). STERCULIA quadrifida, R. Br.—The mucilaginous substance of the unripe pod eatable.

FRUITS.

41. AVICENNIA offinalis. Mangrove. *Egaie* (Clev. Bay tribe), *Tagon Tagon* (Rkh. tr.).—Generally in estuaries of rivers and creeks. A small tree, but sometimes attaining 18 inches in diameter. Small numerous roots protrude at the base of the crooked trunks. Leaves pale green above, and white tomentose underneath. Fruit heart-shaped, with two thick cotyledons. The aboriginals of Cleveland Bay dig a hole in the ground, where they light a good fire; when well ignited they throw stones over it, which, when sufficiently heated, they arrange horizontally at the bottom, and lay on the top the *Egaie* fruit, sprinkling a little water over it; they cover it with bark, and over the whole earth is placed, to prevent the steam from evaporating too freely. During the time required for baking (about two hours), they dig another hole in the sand; the softened *Egaie* is put into it; they pour water twice over it, and the *Midamo* is now fit for eating. They resort to that sort of food during the wet season, when precluded from searching for any other.—*Murrell's Testimony.* (The late James Murrell was a wrecked sailor, who lived seventeen years amongst one of the Cleveland Bay tribes, in Northern Queensland, Australia). Near Mount Elliott and Cleveland Bay there is also an eatable root, *Wangoora*, probably a species of Ipomæa. The roots, very bitter, are cut in two, put into water for one hour or one hour and a half, and are afterwards baked for three or four hours, in the same way as the *Egaie;* they then carry it in a dilly bag *(Yella barda)* to the water's edge, where, by pouring water over and pressing it, they make the starch fall upon the bark in the same way as arrowroot falls from the cylinder into the trough; they wash it three or four times until the water is very clear, and the yellow fecula is then fit for use.—*Murrell's Testimony.* This plant may be the same as the one alluded to by Leichhardt, page 284:—"I tried several methods to render the potatoes, which we had found in the camps of the natives, eatable, but neither roasting nor boiling destroyed their sickening bitterness; at last, I pounded and washed them, and procured the starch, which was entirely tasteless, but thickened rapidly in hot water like arrowroot, and was very agreeable to eat, wanting only the addition of sugar to make it delicious—at least, so we fancied."

POISONOUS IN A RAW STATE.

TUBERS—POUNDING, DESICCATION.

42. CALADIUM macrorhizon, Vent. *Hakkin* (Rockh. tribe), *Banganga* or *Nargan* (Clev. Bay tribe).—In moist shady places. A strong herbaceous plant, with very large sagittate leaves. The young bulbs, of a light rose colour inside, found growing on large old rhizomes, are scraped, and divided into two parts, and put under the ashes for about half an hour. When sufficiently baked, they are then pounded by hard strokes between two stones—a large one, *Wallarie*, and a small one, *Kondola*. All the pieces which do not look farinaceous, but watery when broken, are thrown away; the others, by strokes of the *Kondola*, are united by twos or threes, and put into the fire again; they are then taken out and pounded together in the form of a cake, which is again returned to the fire and carefully turned occasionally: this operation is repeated eight or ten times, and when the *Hakkin*, which is now of a green greyish colour, begins to harden, it is fit for use.

43. TYPHONIUM Brownii, Schott. *Merrin.*—In sandy shady places. A small herbaceous plant. Leaves sagittate, entire, or three lobate. Flowers purple, dark, of a disagreeable odour. The tubers, which are yellow inside, are manipulated in the same way as the *Hakkin*, but none are watery, and they are made to adhere together after the first roasting.

SEEDS—POUNDING, MACERATION, DESICCATION.

44. ENTADA scandens, Benth. *Barbaddah* (Clev. B. tr.)—A strong climber. Pod 2 to 4 feet in length, and 3 to 4 inches in breadth. The seeds, $1\frac{1}{2}$ to 2

inches diameter, are put into the stove oven and heated in the same way, and for the same time as the *Egaie;* they are then pounded fine and put into a dilly-bag, and left for ten or twelve hours in water, when they are fit for use. —*Murrell's Testimony.*

45. CYCAS media, R. Br. Nut Palm. *Baveu.*—Very common on the mountain sides and in valleys. A graceful tree, with a crown of fruit the size of a walnut, yellow when ripe. The nuts are deprived of their outer succulent cover (*sarcocarp*), and are then broken; and the kernels having been roughly pounded, are dried three or four hours by the sun, then brought in a dilly-bag to the water stream or pond, where they remain in running water four or five days, and in stagnant water three or four days. By a touch of the fingers the proper degree of softness produced by maceration is ascertained. They are afterwards placed between the two stones mentioned, reduced to a fine paste, and then baked under the ashes in the same way that our bush people bake their damper.

SEEDS—POUNDING, MACERATION.

46. ENCEPHALARTOS Miquelii, Ferd. Mueller. Dwarf Zamia. *Banga.*—Mountains and valleys. Found generally in the same locality as the palm nut, with a large cone-fruit not unlike a pine-apple. The seeds, orange red when ripe, and separating freely, are baked for about half an hour under ashes; the outside covers and the stones are then broken, and the kernels, divided by a stroke of the *Kondola*, are put into a dilly-bag and carried to a stream or pond, where they remain six or eight days before they are fit for eating.

47. ENCEPHALARTOS Denisonii, Ferd. Mueller. Leichhardt's aborescent Zamia. Prepared in the same way as E. Miquelii.

APPENDIX.

The colouring principle of all the following barks is perfectly soluble in water; cotton, woollen, and silken goods dyed with the aqueous infusion assumed the colours specified in Table on next page.

The affinity of vegetable tissues for colouring matter being in general not so great as that of animal tissues, the woollen material was in nearly all cases dyed of a more decided and darker colour. The exceptions were—the infusion of the bark from the root of *Sarcocephalus cordatus*, and the infusion of the bark of *Alstonia constricta;* with these, cotton, woollen, and silken material assumed a colour of equal intensity.

Ranged according to their percentage of tannin the barks would stand thus:—

The barks of *Acacia harpophylla*, *Petalostigma quadriloculare*, and *Melodorum Leichhardtii* rank first; they afford highly astringent infusions, and evidently contain a notable amount of tannin. Next come the barks of *Croton insulare* and *Rhamnus Vitiensis;* then the barks of *Chionanthus picrophloia*, *Xanthoxylon brachyacanthum*, *Erythroxylon Australe*, and *Guettardella putaminosa.* Lastly, the barks of *Sarcocephalus cordatus*, *Alstonia constricta*, and *Morinda tinctoria.*

The bark of *Croton insulare*, on being distilled with water, yields an oil of an agreeable spicy odour, not unlike mace.

The bark of *Melodorum Leichhardtii* likewise yields an oil, on being distilled with water, possessing a pleasant cinnamon odour.

BARKS.		I.—COTTON FABRIC.				II.—WOOLLEN FABRIC.			III.—SILKEN FABRIC.	
Name of Bark.	From	Colour of the Dyed Fabric.	The Dyed Fabric wrought through a solution of a fixed alkali: colour changed to	The Dyed Fabric wrought through a solution of an acid: the colour was	The Dyed Fabric wrought through a solution of bichromate of potash: colour changed to	Colour of the Dyed Fabric.	The Dyed Fabric wrought through a solution of bichromate of potassa: colour changed to	The Dyed Fabric wrought through a solution of protosulphate of iron: colour changed to	Colour of the Dyed Fabric.	The Dyed Fabric wrought through a solution of extract of indigo: colour changed to
Bark of Chionanthus picrophloia	Queensland	Pale brownish yellow	Brownish yellow	Render'd paler but brighter	Pale brown	Pale brownish yellow	Brownish yellow	Greenish yellow	—	—
Bark of Acacia harpophylla	"	Pale reddish brown	Light reddish brown	"	Dark brown	Reddish br'wn	Dark brown	Dark dingy olive green	—	—
Bark of Xanthoxylon brachyacanthum	"	Pale brownish yellow	Brownish yellow	"	Pale brown	Brownish yellow	Dark brownish yellow	Greenish yellow	—	—
Bark of Croton insulare	"	Pale reddish brown	Light reddish brown	"	Dark reddish brown	Pale reddish brown	Light brown	Pale dingy olive green	—	—
Bark of Petalostigma quadriloculare	"	Pale brownish yellow	Brownish yellow	"	Dark brownish yellow	Brownish yellow	Light brown	Dark dingy olive green	—	—
Bark from root of Sarcocephalus cordatus	"	Bright canary yellow	Yellow	"	Yellow faintly ting'd brown	Bright canary yellow	Yellow faintly ting'd brown	Dull yellow	Golden yellow	Pretty sea green
Bark of Melodorum Leichhardtii	"	Pale brownish red	Bright light red	"	Dark rich brownish red	Bright brownish red	Dark brownish red	Dark dingy olive green	—	—
Bark of Erythroxylon Australe	"	Pale brownish yellow	Brownish yellow	"	Light brown	Pale brownish yellow	Light brown	Greenish yellow	—	—
Bark of Rhamnus vitiensis	"	Pale reddish brown	Reddish br'wn	"	Light brown	Pale reddish brown	Dark brown	Pale dingy olive green	—	—
Bark of Guettardella putaminosa	"	Pale brownish yellow	Brownish yellow	"	Brownish yellow	Brownish yellow	Dark brownish yellow	Greenish yellow	—	—
Bark of Alstonia constricta	"	Canary yellow	Canary yellow	"	Yellow faintly ting'd brown	Canary yellow	Yellow faintly ting'd brown	Dull yellow	Bright canary yellow	Rich grass green
Bark from root of Morinda tinctoria	N. Caledonia	Pale orange yellow	Pale orange yellow	Changed to dull yellow	Pale reddish brown	Dull orange yellow	Dark dull orange yellow	Light brown	—	—

RESINS, GUMS, DYES, COTTON, INDIARUBBER, GUTTA PERCHA, MATERIAL FOR PAPER-MAKING, &c.

Class III.—Section 7c.

W. JOHNSON, ESQ., GOVERNMENT ANALYTICAL CHEMIST, CHAIRMAN.

HON. W. M. K. VALE, M.P.	REV. J. J. BLEASDALE, D.D.
GEORGE WRAGGE, ESQ.	J. R. HOCKNELL, ESQ.

MANY years must necessarily elapse before new colonies like those of Australia can hope to have manufactures such as are produced by older nations, like all other new countries they will in their first years be necessitated to depend mainly upon their agricultural and pastoral pursuits and such raw products as are indigenous or that require but little labour to cultivate. Labour is always under these conditions an article of too precarious supply and too expensive to enable manufactures of a permanent kind to be extensively established, especially where population is too sparse and too migratory to be depended upon. In the great seats of industry at home an employer can at a few hours' notice always procure abundance of skilled hands, but in a new place he must teach afresh every time he changes. Such a result is inevitable.

Under these circumstances it becomes doubly important to know what are the raw materials that are easily procured or produced, that without being manufactured can be exported with profit to the older markets of the world.

Resins and gums abound in all the colonies of Australasia. In New Zealand, especially, a vast amount of hard resinous gum, resembling copal, is obtained as a fossil, and extensively exported for varnish making. Mr. Benjamin Gee exhibits a magnificent block of this Kauri gum, clear and pale, and weighing many pounds.

From Tasmania Mrs. Mitchell sends a very fine sample of a gum resin, which if not Sandarac, certainly so much resembles it as not readily to be distinguished; unfortunately, it is not stated whether it can be obtained abundantly or not. Grasstree gum, a gum resembling dragon's blood, and years ago suggested as a source of picric acid, is exhibited from Tasmania, New South Wales, and Western Australia, this latter colony also sending several exhibits of xanthorrhœa, or blackboy, a gum strongly resembling the grasstree gum in its properties, and making when dissolved a very excellent hard varnish. From Perth, Mr. Shenton sends hakea gum, said to be found plentifully after autumn rains, also gum of *Nutsia floribunda.* Nearly all the colonies send samples of acacia gums; South and Western Australia in particular send very fine, large, pale, and clear specimens. From Netherlands-India also we have samples of gums, including some very fine benzoin; astringent gums from eucalypti, resembling kino, are shown by all the colonies; and from Perth Mr. Carr exhibits liquid red gum, and Mr. Wyndham, of Dalwood, two bottles of appletree sap or juice, said to possess remarkable medicinal virtues in dysentery, &c.

Several vegetable dyes are exhibited, amongst them one very remarkable "black dye, or natural ink," obtained by Mr. Taylor, Clarence River, from the berries of a native plant; it becomes a pure black after exposure to air on some fabric.

Indiarubber and gutta-percha are amongst the exhibits from Netherlands-India, but though interesting can scarcely be considered as strictly belonging to intercolonial industry.

Materials for paper making appear to abound in the Australian colonies. Mr. Newbery first called attention to the fact that good paper might be made from some of the wild grasses, otherwise useless, that grow plentifully near the sea beach and other places, and exhibits very good specimens of several papers so prepared, and the plants from which they were produced. A medal was awarded to this gentleman for his discovery.

Dr. Mueller also exhibits a very fine collection of papers, which he has succeeded in preparing from about thirty different indigenous plants, and embracing a great variety of textures. So important, indeed, was this collection considered, and so encouraging to the prospects of paper making in Victoria, that a medal was also awarded for this exhibit. Materials for paper making were sent by all the colonies. The most remarkable, however, was the teatree bark, sent by the Central Committee from Western Australia. This magnificent specimen almost resembles a ream of very thin tissue paper, somewhat torn at the edges, and of light brown colour; and its qualifications as a material for paper-making seem obvious. It is to be hoped it can be obtained with sufficient ease and abundance to make it economically available.

Flax and hemp, both raw and in various stages of manufacture, are rather numerously exhibited, and bid fair to become one of the staple products of the country, in which it flourishes well. There is little doubt that in a few years the manufacture of linen and other fabrics in which flax and hemp are used will be extensively carried on in these colonies, and give employment to thousands of artisans, increasing the general prosperity of the community. One gentleman (Mr. Kidd) we understand has already nearly two hundred acres of land under cultivation for flax, and as this has been arrived at gradually there can be no risk in the speculation. This same gentleman has fine exhibits of flax in all its stages of manufacture, including flax silk, and other peculiarly dressed samples.

WM. JOHNSON, Chairman and Reporter.

The following were the Awards of the Jurors in this Section:—

MEDALS.—VICTORIA.

192 Mueller, Dr.—Paper, and Materials used in making.
20a Newbery, J. C.—Paper, and Materials used in making.
210 Spadoni, Guiseppe.—Italian Hemp, very fine samples, various.

HONOURABLE MENTION.—VICTORIA.

160 Baker, T., Nunawading.—Barks for Tanning.
17 Holdsworth, J., Sandhurst.—Colonial Gum Acacia, White Bottle Wax, and Specimens of New Zealand Earth Wax.
291 Mitchell, Mrs. George, Carlton.—For Hair Preparation, &c.
206 Shaw, C., 113 Stephen-st., Melbourne.—Thread of American Agave, for Paper, &c.

MEDAL.—NETHERLANDS-INDIA.

1 Morgan, Melbourne and Co., Batavia.—India-rubber, Gutta Percha, Gum Benzoin, Fibres, &c.

MEDAL.—NEW SOUTH WALES.

118 Wyndham, John, Dalwood, Crampton, Hunter River.—For Collection of Gums, Barks, &c., for Tanning, Paper-making, and other purposes.

MEDAL.—SOUTH AUSTRALIA.

77-80 Wehl, Dr.—For Flax, Cordage, &c.

HONOURABLE MENTION.—TASMANIA.

194 Backhouse, R., Sandy Bay.—For Flax and Fibrous Grasses.
197-9 Boyd, J.—For Curjyong Fibre and Barks of different trees, &c.
— Marsden, Mr.—Strong Coarse Flax, for Cordage.
669 Mitchell, Mrs.—Sandarac Gum, very superior.

MEDALS.—WESTERN AUSTRALIA.

63, 64 Central Committee.—For Materials for Paper Making, including Tea-tree Bark, Fibre, &c.

HONOURABLE MENTION.—WESTERN AUSTRALIA.

34 Carr, J. D. C., Perth.—Interesting Collection of Gums.
35 Carter, Messrs. T. and H.—Sample of Gum.
95 Price, R. F.—Sample of Gums.
97 Ranford, B. B., Perth.—For valuable Collection of Barks.

MEDAL.—NEW ZEALAND.

73a Scott, John.—Valuable Collection of Flax, in different stages of manufacture, and for Twines.

HONOURABLE MENTION.—NEW ZEALAND.

32 Biggs, Frederick, and Sellar, J.—Dried and Bleached Flax.
35 Gee, Benjamin.—Specimens of Prepared Flax.
35 Gee, Benjamin.—For Kauri Gum.

MEDALS.—NEW CALEDONIA.

7 Bavay, Mons., Imperial Navy, Noumea.—Valuable Collection of Gums, Resins, Barks, Essential Oils, Alcoholic Extracts, &c.
9 Boutan, Mons.—For Expressed Oils, Arrowroots.

HONOURABLE MENTION.—NEW CALEDONIA.

12 Dubois, Dr.—Stem and Fibres of Epeat Plant, for Cordage, &c.
19 Oroabona, Dr.—Vanilla.
24 Vieillard, Dr.—For Gums, Resins, Fibres, Barks, &c.

COTTON.

HAVING examined the various samples of Cotton sent to the Exhibition from neighbouring colonies and Victoria, we beg to report that the finest sample of Sea Island is from Mr. R. Towns, of Queensland, and, at the present reduced quotations in the Liverpool market, is worth 3s. and upwards. A sample of Uplands by the same grower is also good, and would be valued at about 17d. in England.

A sample of Sea Island, by Mr. Grimmond, Victoria, is very good—fine texture, good colour, and fair staple; and also, from same grower, a sample of New Orleans is of good colour and good strong staple, and is altogether the most useful class in the exhibits; it is from this class that most of our domestic cloths are made. Last quotations from home, about 15d.

From Western Australia a very fair sample of Sea Island by Mr. Greenough; and another from Mr. Brown, Victoria, is good.

From New Caledonia there are three samples of Cotton—Sea Island and others; these are all very first-class, and they prove that the climate of that colony is very suitable for the growth of cottons, and that with care and perseverance by growers, we may expect to hear of great success therein.

J. R. HOCKNELL, Reporter.

The following is the List of Awards:—

MEDALS.—VICTORIA.

29 Brown, G., Ovens and Murray.—Sea Island. Good.
33 Grimmond, David, Ovens and Murray.—Sea Island. Good.
33 Grimmond, David, Ovens and Murray.—New Orleans. Best of class.

MEDALS.—QUEENSLAND.

20 Towns, R., and Co.—Sea Island. Best of class.
20 Towns, R., and Co.—Uplands. Good.

MEDAL.—WESTERN AUSTRALIA.

113 Waldeck, F. G.—Sea Island.

MEDALS.—NEW CALEDONIA.

10 Caillard, Dr.
11 Director of Convict Establishment } Three beautiful samples of Cotton.
15 Joubert, M.

HONOURABLE MENTION.—NEW CALEDONIA.

8 Bertheau, M.—Sample of Cotton.

CEREALS, AGRICULTURAL PRODUCTS, AND MANUFACTURES THEREFROM; PULSE, AND FOOD FOR CATTLE.

Class III.—Sections 7, 8.

J. YOUNG, ESQ., CHAIRMAN.

ABRAHAM LINCOLNE, ESQ.	J. YEO, ESQ.
R. M'DOUGALL, ESQ.	SAMUEL RAMSDEN, ESQ.
J. C. RIDDELL, ESQ., M.P.	F. SEARCH, ESQ.

The jurors have very carefully and frequently examined the various exhibits forwarded to the Exhibition, not only from opposite points of Victoria, but from those adjacent colonies which have so liberally come forward and assisted in making the admirable display of those articles included in the above sections.

Upon analysing the exhibits we found that Victoria had credit for a more general excellence and goodness of character than any of her competitors. This is not to be wondered at when it is recollected that in London, in 1862, she was similarly placed, and was awarded more medals for her flour and cereals than any of her sister colonies. Since then Victoria has very creditably sustained her position, and we doubt not will continue to do so, unless her energies be cramped by any unforeseen causes.

To particularise the character of each exhibit would occupy too much space. We will merely observe generally that those samples exhibited by the Board of Agriculture, and which were retained by them under certain conditions from the growers and owners of the grain at the last National Grain Show in Melbourne, were very superior, and in every way worthy of the awards assigned them; the names of the growers will be noticed in the *Catalogue* issued by your honourable Commissioners. The Wheats in particular were very superior, and mostly produced off the basaltic soils of Berwick, about thirty miles south-east of Melbourne, during the severest season of drought ever experienced in Victoria. No means were at command to enable the Jurors to test the qualities of the grain by weighing; this is to be regretted, especially by those who only obtained "honourable mention" for "goodness of quality," and whom it is difficult to satisfy by any other means than weighing. Although the wheats of Berwick took off three prizes at the last National Grain Show, there were other grains in the Exhibition Building which were, in the opinion of the Jurors, quite equal in every respect to them—we instance the splendid sample exhibited in Mr. Orlebar's name, from Warrnambool (White Tuscan), and Nos. 1, 13, 16, (White Tuscan), and 17 (P. Straw), from South Australia, and 151, from Tasmania. With few exceptions, there was an absence of care in the getting-up, which latter defect ought never to characterise wheats intended for exhibition. We have no wish to mention any one particular colony as being remiss in this respect; but any visitor inspecting the samples will find the majority materially and disadvantageously affected by the presence of broken grains, small grains, and even chaff; the jurors were inclined to be liberal with the exhibitors of these samples, and centred their attention more towards the perfect grains than the general appearance of the samples. For Flour Victoria stands very favourably in the opinion of the Jury, who cannot speak too highly of at least six of the exhibits under this head, and to which they have awarded medals. To South Australia also is awarded two medals for flour, but none to the other colonies. In Barley Malt the Victorian exhibits were very fine, especially those of the latter, exhibited by Messrs. Gough and Co. The jurors especially notice the "patent black" malt manufactured by this firm; and being the sole makers of this article in the colony, the majority of porter brewers obtain their supplies of porter malt from this factory. The former system adopted by brewers and maltsters in roasting pale malt into a high-dried article is improved upon, and a patent has been granted for the new mode, and which at present is unknown to the public. The kinds of malt exhibited both by this firm, and by R. Walker, Hobart Town, are most creditable productions, and quite equal to any imported samples; and when the splendid samples of "chevalier" barley exhibited both by Tasmania and Victoria are examined, it is not to be wondered at that the knowledge of malting is carried on with equal facility, and we trust with success, as in England. The two colonies just named have equal

awards also for Oats, both Tartarian and Potato. Although Tasmania has forwarded more varieties of this grain than any other colony, and those of very superior merit, still the exhibits of Messrs. Orlebar, of Warrnambool, and Fiskin, of Lal Lal, in the passage leading to the Annexe, were fully equal in every respect. As was expected, Maize and manufactures from that grain formed a very prominent feature in the agricultural section of New South Wales; she is superior to all other colonies in these exhibits, and this grain forms one of her heaviest items of export. The Meals from different grains were noticeable as products from the various colonies; and while the palm for those extracted from Maize may be fairly claimed by New South Wales, our Melbourne manufacturers are very properly awarded medals for their very superior "Oatmeal." Messrs. Bencraft, M'Kenzie, and Hay exhibited Oatmeal, which was, in the Jurors' opinion, far higher in character than any imported article; and while complimenting them upon their successful efforts, the Jury would wish to mention that the various samples of the former exhibitor have been most artistically placed before the public eye, and that the stand in which they are placed deserved itself an acknowledgment from them for its extreme neatness, beauty of workmanship, and tasteful arrangement. The maker was Mr. J. Seymour, 214 Bourke-street east, and it was a most creditable production.

The inferior grains, such as beans, peas, tares, &c., were numerous as far as regards samples; but the quantities in each sample from some of the colonies were so small (less than a bushel), that, with one or two exceptions, they could not be mentioned in the awards. Small samples, however good, have never that hold on a Judge's opinion which similar grains in larger bulk have. The suspicion of having been hand-picked ought never to exist, but still that suspicion will always cross a Judge's mind while inspecting a small sample of any grain. The hops from Mr. Shoobridge's plantation at New Norfolk, Tasmania, were of a high order of merit, well grown, and well roasted, and presuming that no sulphur was used in the drying, they have maintained a most desirable colour. The same remark applies to those from Messrs. Hooper, Dodson, and Aitken, of Nelson, New Zealand.

A. LINCOLNE, Reporter.

It will afford some idea of the importance of fostering such industries as the production of articles of food, when the following returns of imports are taken into consideration:—

Article.	1860.	1861.	1862.	1863.	1864.	1865.	1866.
	£	£	£	£	£	£	£
Flour (Foreign)..	183,795	28,562	1,969	8,155	157,498	86,152	115,557
Wheat „ ..	118,425	54,762	8,685	12,208	57,060	195,185	838,959
Malt	184,709	189,996	129,849	164,718	152,082	125,721	162,861
Hops............	96,450	84,864	42,041	63,839	52,729	48,179	70,268
Butter............	434,631	222,096	95,548	166,770	86,710	70,606	90,399
Cheese............	96,485	79,129	58,628	76,466	80,082	40,905	75,959
Provisions, Prsvd	28,363	48,919	16,930	22,667	15,297	5,792	10,212
„ Salted	68	—	—	—	—	467	2,996
„ Bacon	92,221	41,420	89,489	68,652	57,250	28,023	89,763
„ Salted Beef	8,242	8,640	2,275	1,863	294	825	2,459
„ Hams.	104,987	66,881	54,077	78,331	49,784	25,669	53,876
„ Pork...	18,836	2,707	2,801	6,104	12,866	1,478	4,541

The following is the List of Awards in Class III., Sections 7 and 8 :—

MEDALS.—VICTORIA.

26 Allan and Baldry, Wangaratta.—Flour. Excellence of quality.
163 Bencraft, George, Melbourne.—Flour and Oatmeal; Pearl Barley and Groats. Excellence of quality.
171 Coffey, J., Creswick.—Wheat. Excellence of quality.
229 Gough and Co., Melbourne.—Barley and Malt. Excellence of quality.
189 M'Kenzie, James, Queen-st.—Oatmeal. Excellence of quality.
20 Moore, John, Wangaratta.—Wheat. Excellence of quality.
167 Per Board of Agriculture:—
Buchanan, Robert, Berwick.—Wheat. Excellence of quality.
Brisbane, James, Berwick.—Wheat. Excellence of quality.
Cole, B. E., Mooneep.—Peas. Excellence of quality.
Fiskin, A., Lal Lal.—Oats and Malt. Excellence of quality.
Holmes, White and Co., Geelong.—Flour. Excellence of quality.
Law, Somner and Co., Melbourne.—Peas. Excellence of quality.
Warrenheip Distillery.—Barley and Malt. Excellence of quality.
Wilson, W., Berwick.—Wheat. Excellence of quality.
194 Orlebar, J., Warrnambool.—Wheat and Oats. Excellence of quality.
199 Railton, D., Melbourne—Grass Seed. Excellence of quality.
237 Thompson and Co., Castlemaine.—Flour and Bran. Excellence of quality.

HONOURABLE MENTION.—VICTORIA.

159 Ashley, E., Victoria-street.—Maize. Goodness of quality.
222 Bencraft, George, Flinders-lane.—Maize Meal. Goodness of quality.
167 Castilla, F., Kyneton.—Flour. Goodness of quality.
14 Chandler, James, Wangaratta.—Wheat. Goodness of quality.
48 Edwards, Henry.—Sample of Malt. Goodness of quality.
27 Evans, D. H., and Co., Wangaratta.—Flour. Goodness of quality.
178 Hancock, B. P., Colac.—Wheat and Barley. Goodness of quality.
188 M'Andrew, Mr., Geelong.—Wheat. Goodness of quality.
19 Robins, John, Campaspe.—Maize. Goodness of quality.
28 Ryan, T., Wangaratta.—Flour. Goodness of quality.
237 Thompson and Co., Castlemaine.—Maize Meal. Goodness of quality.
30 Thunder, A., Sandhurst.—Malt. Goodness of quality.

MEDALS.—NEW SOUTH WALES.

75 Drake, E., Hunter River.—Maize. Excellence of quality.
84 Grafton Commissioners, Clarence.—Maize. Excellence of quality.
281 M'Arthur, J. and W., Camden.—Maize. Excellence of quality.
139 Mort, T. S.—Maizena. Excellence of quality.
141 Portus, H. D.—Maizena. Excellence of quality.
277 Trappitt, W. J., Orange.—Wheat, No. 2. Excellence of quality.

HONOURABLE MENTION.—NEW SOUTH WALES.

63 Blanch, G., Clarence.—Seeds. Goodness of quality.
71 Cobcroft, Hunter River.—Wheat. Goodness of quality.
275 Dalton Bros., Orange.—Wheat. Goodness of quality.
279 Dangar Bros., New England.—Wheat and Maize. Goodness of quality.
83 Golby, A., jun., Hunter River.—Maize. Goodness of quality.
93 Loder, G. T., Hunter River.—Wheat. Goodness of quality.
281 Mitchell, J., Dunmore.—Maizena. Goodness of quality.
101 Murphy, J., Hunter River.—Maize. Goodness of quality.

MEDALS.—TASMANIA.

180 Creswell, C. F., Hobart Town.—Ryegrass Seed. Excellence of quality.
166 Dean, M. W., Launceston.—Barley and Oats. Excellence of quality.

156 Gaunt and Co., Launceston.—Wheat. Excellence of quality.
165 Hadden, J., Green Ponds.—Barley. Excellence of quality.
146 Shoobridge, E., New Norfolk.—Hops. Excellence of quality.
312 Walker, R., Hobart Town.—Malt. Excellence of quality.

HONOURABLE MENTION.—TASMANIA.

311 Brown, D., Green Ponds.—Malt. Goodness of quality.
167 Creswell, C. F., Hobart Town.—Oats and Collection of Grasseed. Goodness of quality.
304 Gibson, W., Hobart Town.—Flour. Goodness of quality.
188 Hogarth, J., O'Brien's Bridge.—Beans and G. Peas. Goodness of quality.
176 Horne, A. J., Palmerston.—Potato Oats. Goodness of quality.
698 Meredith, J., Hobart Town.—Wheat and Grey Peas. Goodness of quality.
187 Murray, W., O'Brien's Bridge.—Beans. Goodness of quality.
309 Walker, R., Hobart Town.—Flour. Goodness of quality.
671 Wood and Spencer, Hobart Town.—Malt. Goodness of quality.

MEDALS.—SOUTH AUSTRALIA.

23 Allen, W., Nariootpa.—Flour. Excellence of quality.
16 Bell, A., Mount Barker.—Wheat—two samples. Excellence of quality.
1 General Committee, Adelaide.—Wheat. Excellence of quality,
21 Magarey and Co., Adelaide.—Flour. Excellence of quality.
13 Smith, A., Mount Gambier.—Wheat. Excellence of quality.

HONOURABLE MENTION.—SOUTH AUSTRALIA.

20 Bevilaqua, L., Lyndoch.—Flour. Goodness of quality.
18 Cant, Griffen.—Wheat. Goodness of quality.
22 Colman, W., Strathalbyn.—Flour. Goodness of quality.
19 Dawson, J., Gawler.—Flour. Goodness of quality.
2-9 General Committee, Adelaide.—Wheat. Goodness of quality.
10 General Committee, Adelaide.—Oats. Goodness of quality.

HONOURABLE MENTION.—WESTERN AUSTRALIA.

35 Carter, W., Perth.—Wheat. Goodness of quality.
196 Muir, A., Albany.—Wheat. Goodness of quality.
105 Smith, R., Perth.—Oats. Goodness of quality.

MEDALS.—NEW ZEALAND.

56 Hay Brothers, Invercargill.—Oatmeal. Excellence of quality.
58 Junor, W. H. B.—Flour. Excellence of quality.

HONOURABLE MENTION.—NEW ZEALAND.

55 Grant and Reid, Riverton District.—Flour and Oatmeal. Goodness of quality.
56 Hay Brothers, Invercargill.—Flour. Goodness of quality.

WINES.

Class III., Section 9.

VERY REV. JOHN J. BLEASDALE, D.D., F.G.S., CHAIRMAN AND REPORTER.

THE HON. J. P. BEAR, M.L.C.	R. H. HORNE, ESQ.
THE HON. C. GAVAN DUFFY.	F. C. KLEMM, ESQ.*
WM. JOSEPH O'HEA, ESQ.	WM. BAILEY, ESQ.
C. FARIE, ESQ.	J. A. PANTON, ESQ.*

AMONG the results of the many important new industries established in Australia, and displayed at the Intercolonial Exhibition, Wine took a prominent position; and as it has now become one of the most hopeful sources of our future national prosperity, your Reporter conceives that any introduction to the report of the Wine Jury would be incomplete if it did not attempt to connect the culture of the vine in Victoria with the principal sources from which the plants had been originally obtained. In a once-esteemed and still useful little work by Mr. Busby, an interesting account may be found of his journeyings in the wine districts of Europe, and of the collection of cuttings which he made for the Messrs. M'Arthur, of Camden, in New South Wales. The produce of that collection has formed the principal source of supply both to Victoria and South Australia.

Another portion of our plants was obtained direct from Spain, Portugal, and France by vineyard proprietors in South Australia, and from them, in several instances, vineyards have been planted in Victoria.

It has been stated that some of the vineyards on the Barrabool Hills, near Geelong, were planted with cuttings brought direct from Germany and Switzerland by immigrants from those countries; but how far this is correct, and to what extent the produce of such vines has spread, it would be difficult now to determine. The multiplicity of names given in different countries, and often in the same country, to a particular kind of vine, renders it often difficult to trace it back to its introducers.

Certain it is that early in 1851, besides the vineyard at Pollocksford, Messrs. Belperroud, Brequet, and Pettavel had a considerable breadth of land under vines; and at Mr. Belperroud's a very drinkable white wine was made, and readily sold at about 30s. per dozen.

With the upheaval of colonial society in 1852, consequent on the discoveries of gold and the influx of population, the infant colonial wine interest was nearly destroyed. The enormous price obtainable for fruit of all kinds, and the comparative cheapness and abundance of imported wine, as compared with the demand for it, rendered it folly to think of converting grapes into wine in Victoria.

For several years little progress was made in forming vineyards. In 1858 and 1859 a move was again made in this direction, but the encouragement to persevere was but slender, and the taste for pure native wine could not be said to exist. Beers, ardent spirits, and hot wines held their empire over the people absolutely. An attempt was made about this time by the late Mr. Ralph Hutchinson, then Sydney agent for the wines of Camden, an excellent practical wine treater, to sell a few small parcels of colonial wines in wood in Melbourne, and to form the nucleus

* Messrs. Panton and Klemm, being Jurors, are prevented from receiving the awards made by their colleagues in favour of their exhibits.

of a trade, but he could hardly get them off his hands, even at a sacrifice. He still, however, kept his eye upon the Melbourne market, and in the autumn of 1859 placed samples of all his best colonial stock in the hands of your Reporter for chemical analysis and other examinations, with a view to their being referred to standards of French, German, and Spanish wines, which he also supplied.

When this work was nearly completed, and a good portion of the report drawn up, there appeared in this city Mr. J. Elliot Blake, whose errand was to try to dispose of a quantity of wine, chiefly from the Hunter River district. He opened a small office in Collins-street, and there, not without some trouble at first, introduced his wine to public notice. From this importation of Mr. Blake's, the Victorian taste for colonial wine really dates. Then for the first time it became a matter on which men of respectability and refinement were not ashamed to express a favourable opinion.

No sooner, however, was a demand beginning to be made for this colonial produce, than most of the smaller establishments which dealt in it were flooded with an article that required hardihood to taste; much bad imported wine, mixed with a little poor colonial, and rebottled, was sold for native Victorian wine. It was for the most part of a character to deter and disgust; and this was the state of the colonial wine trade, in Melbourne especially, during 1861-2-3.

After that time pure wines of genuine merit made their appearance much more commonly, a better class of merchants and dealers took them in hand, and the demand for them has progressed most favourably, as was to be expected. Yet even now, to the discredit of this city, it must be said that in nearly all our best hotels a bottle of really fine Victorian, not to say South Australian, wine cannot be had; not that they do not keep a little, but it is not made a feature in their business; and the way in which the caterers for the Exhibition treated it was enough to show how little they considered it to be in demand by their customers. Yet in spite of this apparent apathy on the part of those who might be justly looked to as the leaders in an industry of this nature, the human instinct goes on displaying itself, and the demand is increasing at an enormous ratio. All honour to those who had the bravery to open their wine stores, and sell a good sound article at a moderate price. It is more than can be said of Sydney, that a man can obtain in Melbourne a single bottle of good wine for one shilling, or have it delivered at his residence for twelve shillings the dozen bottles; and that he can buy it in the wood at four shillings per imperial gallon. In this we equal the price at which wine is vended in South Australia. At the Adelaide Club, the principal institution of the kind in that city, wines of a very superior quality are placed on the table at one shilling per pint bottle.

In the old countries of Europe nothing could be more trite, not to say wearisome, than long dissertations on the merits of well-known wines—the ports, sherries, clarets, burgundies, and even champagnes; but here all is new, everything is yet more or less in the condition of experiment, and every success we achieve has upon it the freshness of a new discovery, and is as a light on a new and unexplored path that may lead to wealth and prosperity. An interest, therefore, attaches in Australia to details of this new industry which in Europe cannot be looked for; and the

industry itself will have perhaps but little concern for any but our colonists for, as yet, some time to come.

The Jurors commenced their labours on the 18th of December, and continued them almost without interruption, meeting two afternoons in each week until the 21st of March, and held in all twenty-six meetings. All were animated with the same desire of doing strict justice to the exhibits. From the first they adopted the principle so wisely laid down by the jurors of the International Exhibition of 1862—viz., to confine themselves to ascertaining "whether any particular wine showed merit *per se*." They did not consider themselves called upon to determine relatively first, second, and third merit. They decided, however, that the highest number of marks that they would give to any sample should be twenty; that if a wine obtained full sixteen it should be awarded a *medal* for excellence generally, and if it obtained any number between twelve and sixteen it should be entitled to a certificate of *honourable mention*. Any number below twelve would not entitle an exhibit to be named and placed at all.

The Jurors availed themselves of every opportunity of judging of the samples under the most favourable circumstances—having airy rooms to meet in, the wines decanted where it was thought they would be thereby improved, and used the best and most approved form of glasses.

To mention such matters in any but a new country would be silly and superfluous; but they are mentioned here to satisfy not alone our own growers who live at a distance, but those numerous exhibitors from the other colonies, who have every right to know that pains and care were taken to do them justice.

Your Reporter has endeavoured to include a brief account of the districts (so far as he is personally acquainted with them) from which the exhibits were obtained, and thus, while remarking on the samples shown, and endeavouring to do them justice, make this an opportunity for placing on record some account of the present condition and prospects of Victoria as a wine-yielding country. There is some reason to hope that at a future but not distant day, when every hill-side and shaded nook will show its vineyard, and when wine will be as common as milk, the historian of this portion of our native industries will con the pages of these reports not without a feeling of curiosity and interest, and will be even thankful for the progress-mark which the Intercolonial Exhibition has erected.

Perhaps this will be the proper place to observe that the wine was and ever must be at a great disadvantage in an exhibition. To bring it home, like most other kinds of exhibits, to the appreciative senses of the public, something more is required than to show the outside of a sealed and labelled bottle, no matter how tastefully and elaborately it may have been got up. In fact a very large proportion of the exhibits placed in the great hall consisted of bottles filled with some coloured fluid and not wine at all. Wine would, in many cases, have been utterly destroyed. In the wine cellar the visitor might form an idea of the number and variety of kinds of wine, but still only from viewing the outside of the bottles.

Through the special favour of some exhibitors, as Mr. E. J. Peake, Mr. J. Gilbert, Mr. Auld, and one or two others in South Australia; and Mr. Umphelby, Mr. E. J. Panton, Messrs. White Brothers, and a few of the Victorian growers; and also through the kindness of the Agent-General for New South Wales, Mr. Dyer—your Reporter was enabled to

open bottles, and allow such gentlemen as he considered capable of judging of wine, or who wished to select a wine with a view to buying for their own consumption or for trade, to sample it for themselves; and in this way to some small extent the wine was actually exhibited. It is to be regretted that for the rest the public must rely on the judgment of the jurors.

As to the fact of the Commissioners having stipulated with the refreshment contractors to devote a bar especially to the sale of colonial wines, it is true that such part of the contract was carried out; but as an exponent of the nature and vast variety of our native produce, it was simply a failure. It was no more a genuine feature of the Exhibition than was the supply of other analogous colonial produce or manufacture; but when the contract was once signed, and so long as the letter of it was not violated, the Commissioners were powerless. It was in vain that they wished to see the public enthusiastic about our native wines, beers, cordials, &c. If any inference could be drawn from what was to be seen every day, it was that these new tastes and instincts were growing and progressing, but were not yet formed.

The following tabulated statement has been courteously supplied by the Honourable the Commissioner of Trade and Customs, and will, it is believed, be replete with interest for the intelligent reader, as showing the quantity of wine entered at the Custom House during 1866, the various countries from which it was shipped, and the total amount Victoria spent that year on wines.

VICTORIA.—1866.

RETURN SHOWING THE QUANTITY AND VALUE OF WINE IMPORTED DURING THE YEAR 1866, ARRANGED UNDER THE SEVERAL PLACES OF SHIPMENT.

U.K.

Place of Shipment.	Quantity.	Value.
United Kingdom ...	183 pipes, 67 butts, 20 puns, 1437 hhds., 50 half-hhds., 104 brls., 108 casks, 13,380 qr.-casks, 511 octaves, 17,965 cases, 21,301 galls.	£203,156
New South Wales ..	77 hhds., 4 casks, 242 qr.-casks, 46 octaves, 139 cases, 1733 galls.	6,662
New Zealand	13 qr.-casks, 281 galls.	851
South Australia	105 hhds., 18 qr.-casks, 6 cases, 2882 galls.	2,262
Tasmania	1 hhd., 8 casks, 3 qr.-casks, 3 cases, 182 galls.	286
Western Australia	2 galls.	1
FOREIGN STATES.		
Bordeaux	98 hhds., 100 qr.-casks, 6144 cases, 486 galls.	10,213
Bourbon	1 gall.	1
Cadiz	8 galls.	4
Cape Town	24 galls.	23
Charente	1259 cases, 296 galls.	1,198
Hamburg	30 cases, 15 galls.	96
Mauritius	4 galls.	5
Oporto	50 hhds., 1242 qr.-casks, 185 cases, 20 galls.	14,282
Rotterdam	1213 cases, 52 galls.	1,834
San Francisco	73 galls.	28
Tomé	10 galls.	10
Total	183 pipes, 67 butts, 20 puns, 1768 hhds., 50 half-hhds., 104 brls., 120 casks, 14,998 qr.-casks, 557 octaves, 26,944 cases, and 27,373 galls.	£241,132

J. G. FRANCIS, Commissioner of Trade and Customs.

Custom House, Melbourne, 26th April, 1867.

It would appear that only about £3000 worth of wine was imported from South Australia and New South Wales, and that the whole of the rest of the amount (£241,132) was for wine of foreign growth, whether arriving direct or coming through other colonial ports.

In round numbers Victoria imported from South Australia 9000 gallons, valued at five shillings (5s.) per gallon, and very nearly, if not quite, the whole may be presumed to have been of South Australian growth.

From New South Wales Victoria received 13,300 gallons, at a declared value (average) of 10s. per gallon. Consequently very little of this could have been colonial produce.

So that the whole of the colonial wine imported into Victoria from the Australian colonies, calculated at half a bottle per head, would about suffice for the population of Melbourne for *one day*.

One may be pardoned for wishing to see in future a much larger proportion of our cash spent on the purchase of colonial wine, which, for its generous qualities, deserves our most favourable consideration.

The evidences afforded by the samples shown in the Exhibition would be of themselves sufficient to convince any one acquainted with the instincts of habitual drinkers of genuine pure wines, that the districts south of the Dividing Range, beginning with Geelong and extending by Sunbury, Mount Macedon, Yering, and so on eastward, will yield the kinds most generally demanded for every-day consumption; for in a very short time wine-drinkers come to prefer for their own use what they call "a big drink," "a mouthful of wine with a nose on it," "a light, wholesome, refreshing tumbler-full, with no fear of its getting into their heads." And, in fact, experience everywhere proves that in wine-yielding countries, where it is the universal beverage, morning, noon, and night, where the lighter sorts cannot be had cheap water is *always* added as a matter of course.

A great deal has been urged against vineyard properties on account of the high price of labour in the colonies; the statement often has to be combated, "How can we export wine grown in a colony where labour is three times the cost it is in the great wine-producing districts of Europe?" Much may be said in reply. A system is now rapidly springing up amongst all the principal growers in Victoria, of letting the culture of their vineyards by contract, so much per acre per annum, to do every description of work that is required—the working of the land, the cultivation of the vine, assisting at the ingathering of the grapes, and making the wine in the cellar. The prices paid by the leading growers is not yet uniform. In the district of Geelong it is from £8 to £10 per acre; in the Yering district, £9 to £10; in the Goulburn district large areas of vineyard are let by contract at £5 per acre; in the Sunbury district the price is £4 10s. to £7 per acre. There can be little doubt the uniform price for cultivation will shortly be £5 per acre if horse labour is allowed, and £6 to £7 for hand cultivation in all the leading vineyards growing wine for general sale. No doubt even this price for cultivation only will rather astonish the agriculturist, when many crops of wheat standing in the ear are sold for less money: but under this system the proprietor knows what he has to pay, and at what point to commence to look for interest on his outlay. Six good vintages may be reckoned upon out of seven years. It may be stated generally that, with the increased yield of the vine in the Australian climate, and the comparatively cheap cost of the

land, aided with a sound system of contract cultivation in the vineyard, the proprietors should not permit themselves to be worsted in the open markets of the world.

The subjoined table, taken from the statistics just published, shows the total amount of wine for 1866 to have been 195,953 gallons. Taking the population of Victoria to be 633,000, this quantity would allow about five half-pints to each individual—a quantity hardly sufficient to supply the colony for *three days* if ours had become a wine-drinking population. There is an end then to all talk about this colony being in a position at present, or likely of becoming so for a few years, to supply anything approaching the wine required by the people, in proportion as their instincts draw them more and more to it.

VICTORIA.

THE ACREAGE UNDER VINES, AND THEIR PRODUCE IN EACH COUNTY AND UNSETTLED DISTRICT, AND IN THE ENTIRE COLONY, DURING THE YEAR ENDING 31ST MARCH, 1867.

COUNTIES AND UNSETTLED DISTRICTS.	VINES.					Wine produced.	Brandy manufactured.
	No. of Acres under Vines.	No. of Vines.	Grapes Gathered.				
			Not made into Wine or Brandy	Made into Wine or Brandy	Total.		
Counties.	No.	No.	Cwt.	Cwt.	Cwt.	Gals.	Gals.
Anglesey	4	4,000	10	...	10	...	...
Bourke	704	1,008,970	2,299	3,097	5,396	17,546	...
Dalhousie	50	92,300	235	29	264	200	...
Dundas	7	13,162	99	198	297	360	...
Evelyn	365	929,348	110	5,231	5,341	33,004	...
Follett	...	...	...	...	...	...	...
Grant	1004	2,241,881	1,972	7,409	9,381	50,728	21
Grenville	36	76,400	64	308	372	2,033	...
Hampden	...	...	...	...	...	...	...
Heytesbury	...	...	...	...	...	...	...
Mornington	56	115,840	62	245	307	975	...
Normanby	23	30,000	43	13	56	60	...
Polwarth	4	10,000	3	17	20	110	...
Ripon	50	90,000	234	184	418	181	...
Talbot	270	470,000	2,875	1,300	4,175	9,000	...
Villiers	42	67,000	92	130	222	432	...
Unsettled Districts.							
Gipps Land	10	17,090	112	80	192	450	...
The Loddon	425	744,614	4,854	2,778	7,632	15,116	...
The Murray	848	1,374,080	296	14,534	14,830	62,935	...
Rodney	58	147,750	383	326	709	2,254	...
The Wimmera	95	236,691	760	139	899	569	...
Total, 1867	4051	7,669,126	14,503	36,018	50,521	195,953	21
Total, 1866	4078	8,199,618	18,063	31,686	49,749	176,959	795
Increase	...	...	...	4,332	772	18,994	...
Decrease	27	530,492	3,560	...	...	...	774

NOTE.—The acreage and number of vines are for the year ending 31st March, 1867; the quantity of grapes gathered, and of wine and brandy made, are for the previous season. The grape crop comes in too late to admit of its being returned when the agricultural statistics are collected.

1875 vines = 1 acre

WILLIAM HENRY ARCHER, Registrar-General.

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195 53

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WINES OF THE GEELONG DISTRICT.

Some of the vineyards of the Geelong district are reputed to be the oldest in Victoria—that occupied by Messrs. Galland and Junod, at Pollocksford, having perhaps the best claim to that designation. Those of Messrs. Bellperroud, Brequet, Pettavel, and Dardel were in full bearing when first seen by your Reporter in 1851, and had, from the appearance of the cellars, already yielded a good deal of wine.

It is worthy of remark that this is one of the few districts in Victoria where lime and sandstone occur in large quantity, and, also, that it is exposed in an exceptional degree to the chilling south winds; the whole back country lying towards the sea being comparatively low and densely timbered. In average years the grapes would be backward, and in less sheltered localities irregularly ripened. Then, again, the method of wine-making pursued by many is that of Switzerland and the colder countries of Germany; and the aim has been to produce wines of the hock and burgundy character. And certainly, if any district in this continent is calculated for such wines, it is that of Geelong, taken as a whole. And exactly in proportion to the age of the vines, the skill bestowed on cultivation, and the care and intelligence brought to bear on making and maturing these delicate wines, has been the success of the cultivators. Much poor wine has come from Geelong, and also some of the finest, if not the very finest, of our delicate samples.

Among the best of the light agreeable kinds, such as we have begun to call summer wines, shown at the Exhibition, were the white wines of Dr. Hope, and the 1866 White Pineau and Riesling of Weber Brothers, and the red of Messrs. Galland and Junod. There was no question for one moment that each of these samples was of itself enough to entitle its maker to a medal for excellence of quality. The white wines being thin and delicate for the most part, demand care and skill in maturing them, and much caution about what substance, if any, is to be used in fining them.

GEELONG.

Medals.

The jury awarded medals for excellence of quality to the following exhibitors:—

RED WINES.

56 Galland and Junod, Pollocksford, Geelong.—Hermitage, of the vintage of 1866. This was in every respect a fine, firm, well-made wine.
17 Weber Brothers, St. James's, Geelong.—Hermitage of the vintage of 1865.

WHITE WINES.

77 Hope, Dr., Batesford, Geelong.—White Wines of 1866.
— Weber Brothers.—Pineau and Riesling.

Honourable Mention.

The following exhibitors were awarded certificates of honourable mention for the exhibits named. These wines were good indeed, but in some particulars did not come up to the idea of excellent.

RED WINES.

65 Comeford Gardens.—Hermitage, 1866.
22 Dardell, J. H., Paradise Vineyard, Geelong.—Schiraz, 1865, an agreeable full-bodied wine; also Hermitage, 1865, and Burgundy.
58 Dunoyer, J.—Hermitage.
39 Hope, Dr., Lynburne.—Red Wine.
64 Mathey Brothers and Co., Murgheboluc.—Hermitage.

WINES OF SUNBURY AND RIDDELL'S CREEK.

(Distant from Melbourne from 25 to 35 miles.)

Proceeding eastward from Geelong, the first and most rising district is that about Sunbury. These vineyards are all planted on a volcanic trap soil. The situation of the vineyards is considerably varied, some being on the eastern and northern slopes of a hill of moderate elevation, the others lying on the level, and those very near Sunbury on the edge of Jackson's Creek.

The rapid strides in vineyard culture that have taken place in and around this district during the past four years are remarkable. One of the largest vineyards in Australia is here situated, and since its formation (the district having been found so admirably suited for the vine) vineyards are springing up in many directions. Upwards of 300 acres are already devoted to this culture within a radius of fifteen miles of this place. Situated well back from the seaboard, it is not exposed to those rapid changes of temperature that many vine-growers have to contend against; consequently wines remarkable for sweetness were forwarded to the Exhibition from this district, and the collection being large and various, several honours fell to exhibitors from this place.

The wines from the district of Riddell's Creek are worthy of note, being from a new and untried locality. Situated upwards of 1000 feet above the level of the sea, these wines formed the subject of close criticism by the Wine Jurors. They were grown upon a rich basaltic soil, on the slopes of a well-sheltered valley, the varieties being principally Pineau Blanc, Hermitage, Verdeilho, and Carbenet Sauvignen (the true Medoc claret grape), the latter being a most valuable wine grape, and but little cultivated in Victoria. Subsequent to the decision upon the latter wine by the Jurors, the principal medical men in Melbourne met at the Exhibition-building, for the purpose of sampling both the strong and the light wines. It was decided by them that the Carbenet Sauvignen, grown in the district of Riddell's Creek, was the best of the light wines suitable for hospital purposes; the names of none of the growers being known until after the decisions were arrived at.

The theory is now therefore completely upset that good wines cannot be made upon the south side of the Dividing Range. Your Reporter can affirm, from his knowledge of locality and the additional experience gained by studying the collection sent into the Exhibition, that wines as various as those from the Medoc and Xeres are to be found within a radius of eighty miles around Melbourne; or, by way of comparison with Australian wines, the variety to be met with within the distance stated may be classed as varying from the light wines of Geelong to the heavy wines of Adelaide.

So far, then, the growers, who appear to have invested much more capital on the south side than on the north side of the coast range, have only to study and plant the best varieties of vines suited to their particular locality, and adopt the most skilful mode of manufacture, to ensure the production of good marketable wine. They may rest assured that the taste for the lighter wines is a growing one, converts the public first from ardent spirits and lower-classed beverages, and the palate, if not utterly vitiated, will very quickly seek out the purest and lightest wine that can be obtained.

Whilst encouraging the growers south of the coast range, your Reporter must not be held as lightly to pass by the produce of those on the north side. To pay them the highest compliment in the fewest words, it may be said, "Their wines are so good they will take care of themselves." The Sandhurst and Castlemaine districts promise to produce wine second to none in Australia—wines in themselves possessing a high marketable value, not alone for the purposes of consumption, but for blending with weaker ones. In a commercial point of view, it is difficult to imagine that aught but success must attend well-managed vineyards in well-selected sites and soils in such a glorious climate.

The energy and enterprise of the vignerons—Swiss, German, French, and English—is testing at all points this section of Australia Felix. The climate is being examined in every direction. The Exhibition brought to light wines the produce of districts never credited with the merit of making even the first attempt: wines from Gippsland, wines from Wagga Wagga, wines from near the summit of the coast range, wines from the Murray Plains, wines from Tasmania, wines from Western Australia. So rapid has been the progress and the determination to test new and untried localities, and so startling have been the results, that no one is safe from contradiction if he ventures to place his finger on the map, and say wine cannot be grown in such and such districts, when it is remembered that good ripe grapes are now produced well towards the summit of Mount Macedon.

It is much to be regretted that no exhibits of wine were sent in to the Exhibition from the beautiful vineyard of the Hon. J. G. Francis, at Sunbury, situated on the steep slopes rising from Jackson's Creek. One half of the vineyard consists of rich basaltic soil, terraced to suit the inequalities of the ground; the remaining portion of the vineyard consists of a rich alluvial flat, the vines upon this being cultivated on wire trellises. It would have been extremely interesting to have received wines from this vineyard, on account of the great care and costly mode of cultivation that has been adopted. The results arrived at on this vineyard would have borne the freshness of a new discovery. No doubt these wines were not sent forward on account of the age of the vineyard.

{Youth
Newness

Prominent among the exhibitors from these districts is the very energetic and enterprising manager of one of the largest vineyards within one hundred miles of Melbourne—those at Sunbury; himself also the owner of a fine vineyard at Riddell's Creek—Mr. George William Knight. To wines of the kinds enumerated below was awarded a medal for their general excellence, and it may here be remarked, had Mr. Knight exhibited but one specimen of any of these wines, he would have received an equal distinction, the rule of the Commission being that only one medal can be awarded to any single exhibitor. This limitation does not, however, detract from the merit due to those who are exhibitors of various samples in any particular class.

Medal.

RED WINES.

38 Carbenet, 1865.
34 Hermitage, 1865.

WHITE WINES.

107 Pedro Ximenes, 1865.
161 Pineau Blanc, 1865.
162 Pineau Gris, 1865.
164 Pineau and Riesling, 1865.
163 Verdeilho and Riesling blended, 1865.

The following wines were exhibited by the owners of the aggregated vineyards at Bald Hill, Sunbury, and received—

Medals.

80 Adams, R., Bald Hill, Sunbury.—Hermitage, 1866.
111 Ditto ditto Grenâche, 1866.
112 Bear, T. H.—Mataro, 1866.
Ditto Bald Hill, Sunbury.—Mataro, 1866.
61 Stodart, J., Bald Hill, Sunbury.—Muscat, 1866.
110 Ditto ditto Rough-leaved Burgundy, 1866.

Honourable Mention.

WHITE WINES.

165 Knight, G. W., Riddell's Creek.—Hermitage, 1866.
159 Ditto ditto Pineau Blanc, 1864.
160 Ditto ditto White, 1865.
57 Ditto ditto Verdeilho and Riesling, 1865.

RED WINES.

106 Clark, W., Glenara, Bulla.—Pineau Noir, 1865.
49 Ditto ditto Hermitage.
6 Ditto ditto Hermitage, 1865.
166 Knight, G. W., Riddell's Creek.—Carbenet, 1866.

WINES OF THE MELBOURNE DISTRICT PROPER.

(That is, within a radius of twelve miles.)

There were several interesting samples in the Exhibition from about Brighton, Heidelberg, and Pentridge. They all belonged essentially to the character of wines of a coast exposed to rapid and frequent changes of temperature, and even extremes of heat and cold. But they all displayed, in a greater or less degree, the want of thorough knowledge of the treatment of such characters of wine. Among these exhibits were a few from about Hawthorne that had no doubt been good at some previous period, but which did not arrive at the standard of excellence set up by the judges. It is, therefore, not surprising that few distinctions, if any, fell to the exhibits of the metropolitan district. One or two writers in the papers have anonymously accused the Jury of partiality in not taking a more favourable view of the wines of this district; but there is no other reply to them than that the judges had no prejudices, and were nearly always quite unanimous; and they were unanimous, after repeated examinations of these exhibits, that they were not what they ought to have been. There is no intention of disparaging the district for such wines as it ought to yield, but it must be put on record that the specimens that fell under the notice of the Jurors were deficient in those good qualities that were necessary to entitle them to distinction: some had been badly made, others kept past their best. Great attention was paid by the Jurors to this division, and great regret was expressed at the verdict they were compelled to return.

It is much to be regretted that several growers and makers of wine about South Yarra and Hawthorn did not exhibit. As it is, the show from the city district was far below what it ought to have been.

Honourable Mention.

WHITE WINES.

66 Pin, J. B., Merri Creek.—Chasselas, 1866.

RED WINES.

2 Elliott, S., Brighton.—S.E. in diamond, 1866.
45 Everest, T. J., Spring Hill, Upper Hawthorn.—Mataro.
46 Mapleston, C., Ivanhoe.—Hermitage, 1866.
68 Murray, Andrew, Melbourne.—Mataro.

THE YERING DISTRICT.

(Distant from Melbourne about thirty miles east.)

This locality is sometimes called the beginning of our Australian Switzerland. It is, nevertheless, admirably situated for the production of wines of the character of those from about Geelong. For some reason not explained, the exhibits from this district were not numerous, and the quality was for the most part below what is generally known as the best Yering wines. No doubt as a district it will, ere long, be one of the favourites for producing those kinds of light agreeable wines which will eventually be the universal beverage, especially in our hot and dry summer weather.

These wine districts are the only ones of considerable note at present on this side of the Dividing Range. With the increasing demand for wine as a general beverage, the culture of the vine will gradually spread, and many spots now not known will in time acquire a name and fame.

The exhibits from Yering-berg Vineyard, which is situated in the parish of Gruyère, though not numerous, were of a high character, proving that much depends upon the selection of a good site, even in what might be supposed to be an unfavourable climate. Bordering on the Australian Alps, yet sheltered and protected by nature, Yering-berg Vineyard occupies one of the most favourable situations south of the Dividing Range. A medal has been awarded to Messrs. Langdon and De Pury for their Verdeilho, &c.

Medal.

— Bear, T. H., Plenty, Yan Yean.—White, 16 years old, to England and back.
152 De Pury and Langdon.—Verdeilho, 1866.

Honourable Mention.

RED WINE.

— Ross, J., and Co., Yering.—Hermitage, 1866.

THE WINES OF DROMANA.

These came before the judges with a certificate on the bottle that they were made "from the pure juice of the grape," &c.; "no brandy," &c.; "exhilarating, but not intoxicating," &c. They were no doubt the pure juice of the grape, but could not be praised for any distinctive merits. Again, here there appeared want of skill in the manipulation after the wine had been fermented. why then has it got the Hon Mention?

Honourable Mention.

White ~~RED~~ WINE.

114 Victorian Wine Company.—Tokay.

SECOND GRAND DIVISION OF VICTORIAN WINE DISTRICTS.

WINES FROM COUNTRY NORTH OF THE DIVIDING RANGE.

Journeying from the metropolis northward, the first vineyards on the other side of the Dividing Range are in the neighbourhood of Castlemaine, and they are not at all extensive. The produce of the three vineyards with which we are best acquainted is that of Mr. Meredith, of Chewton; Mr. Hirschi, of Castlemaine; and Mr. Schroeder. Here we find what may be termed the transition districts, yielding wines of a character intermediate between those of Geelong and the Murray proper.

All the exhibits from this district were young, but of great promise, and made for the most part on the systems in vogue in Germany, to which they seem capable of being adapted. The wonder is that a larger quantity of land has not been already brought under the vine in the neighbourhood of these old diggings. There are hundreds of acres of these alluvial flats drained to perfection, and the upper surface needing little or nothing more than planting, which would yield fruit abundantly.

Honourable Mention.

43 Meredith, Mr., Chewton.—Tokay.
— Schroeder, Mr., Castlemaine.

SANDHURST DISTRICT.

(Distance from Sandhurst, from 3 to 15 miles.)

At a distance of little more than twenty miles from Castlemaine stands the well-known mining town of Sandhurst, situate a little below the northern face of the hills forming the dividing range, thoroughly protected from the chilling blasts of the south wind, and having its natural sun-heat much increased by radiation from the broad treeless plains stretching to the banks of the Murray. This district is one of the largest and best adapted for the production of generous wine. It enjoys immunity from all danger of a fall of rain during the vintage, and consequently the fruit is ripened to perfection, and fermented at an even temperature. Perhaps, owing to such facts as these, Chasselas, a grape unfit for wine-making at home, produces a very pleasant palatable wine. In fact the climate of Sandhurst differs widely from any south of the Dividing Range in most of those characteristics which distinguish one climate from another. It is hot and dry, but not too dry for the vine. Here we at once come upon a class of wines, especially the red ones, wholly different from any south of the Dividing Range; and judged in relation to their strength, their depth of colour, and spirituous properties, might probably defy comparison with any known unsophisticated wines. Their character, too, in spite of differences in manipulation, is quite distinctive; and there is no wonder at the high estimation in which they are held by the judges when it is borne in mind that they had to judge of them in relation to their excellence *per se*.

Seeing that the first experiments in wine-making on a large scale date back only to 1862, the vignerons have made remarkable progress, if we may judge from the number of excellent exhibits, most of them obtaining

distinction. These samples were derived from vineyards situated at such distances from Sandhurst as to leave little doubt of the capabilities of at least four hundred square miles of country for yielding produce of the same high standing. Amongst vignerons who have taken the most prominent part in developing its resources hitherto may be mentioned—Messrs. Panton, of Huntly; Bruhn, of Emu Creek; Loridan, of Sheepwash (now A. Heine); Heine and Griffenhagen, of Axe Creek; Vlaeminick Brothers, of Axe Creek; Edwards, of Bullock Creek; and Robinson, of the Campaspe. Judging from the published reports in local papers, no small credit is due to Mr. F. C. Klemm for the special services he has rendered in making the wine capabilities of the Bendigo district known. It is to his skilful treatment of them—in making some, and preparing much more for the market—that it first became known what the district could yield. There is no fear but that in future it will hold its own.

Before appending the awards, your Reporter would particularise a Hermitage made by Mr. J. A. Panton, of Huntly, and a superb Riesling exhibited by Messrs. White Brothers, of Melbourne, grown in that district.

Medals.

WHITE WINES.

16 Heine, A., Sandhurst.—Riesling, 1866.
67 Ditto ditto Chasselas, 1865.
136 Ditto ditto Pineau Blanc, 1866.
13 Klemm, F. C., Sandhurst.—Riesling, 1865.
12 White Brothers, Melbourne.—Riesling, 1865.

RED WINES.

148 Heine and Greiffenhagen, Strathfieldsaye.—Hermitage, 1866.
57 Ditto ditto ditto Burgundy, 1864.
26 Panton, J. A., Huntly.—Hermitage, 1866.
91 Ditto ditto Mataro, 1866.
144 Ditto ditto Burgundy.
153 Vlaeminick Brothers, Axe Creek.—Red Wine, 1865.

Honourable Mention.

RED WINES.

Heine, A., Sheepwash, Sandhurst.—Mataro, 1866.
Ditto ditto ditto 1866.
Heine and Griffenhagen, Strathfieldsaye.—Burgundy.
Ditto ditto ditto Hermitage, 1866.
Panton, J. A., Huntly.—Huntly, 1866.

WHITE WINES.

Winzer, W.—Sweetwater, 1864.

WINE FROM ABOUT DUNOLLY.

There was one sample or two of red wine, Scyras, from this district, grown on a limestone soil, that was of itself enough to show how admirably suited is the limited district in which it was produced for yielding wine of the richest and fullest body. The judges at once awarded it a medal, rather as a tribute to the district than the value of the actual produce yet obtained from it. They were, however, quite satisfied from

reports furnished that it was a true specimen of the capabilities of the district for such splendid produce.

Medal.

RED WINE.

109 Cook, George Plumstead, Bet Bet, Dunolly.—La Grange.

WINES OF BENALLA AND WANGARATTA.

These were for the most part of the character of the wines of the great valley of the Murray. Those from the immediate neighbourhood of Benalla were, however, of a description somewhat intermediate between the produce of the south of the Dividing Range and those of Albury. Mr. Piper's agent exhibited several samples of Shiraz, Red Marangan (a very good wine made from the Black Hambro' and Grand Turk grapes), White Marangan, Chasselas, and some Muscats. The Muscats were of a superior quality, and to one of them was awarded a medal for excellence, one of the very few wines of that character deserving of special notice in the Exhibition.

The wines from the district of Wangaratta were generally strong and full-bodied, but seemed to be the produce of young vineyards, and not to have had all the care bestowed upon them which their quality required. They were, however, an evidence of what that fine district is capable of yielding. It was to be regretted that a larger number of samples, and from places further asunder in the district, was not displayed.

WANGARATTA, GOORAMADDA, AND BENALLA.

Medals.

WHITE WINES.

— "Perseverance" (W. Piper), Benalla.—White Marangan, 1864.
45 Ditto ditto ditto White Muscat, 1864.

Honourable Mention.

WHITE WINES.

— "Perseverance," Benalla.—Chasselas, 1864.
9 Rae and Thorpe, Mount Prior.—Riesling, 1864.
11 Ditto ditto Riesling, 1865.
74 Richmond, John, Beechworth.—Chasselas, 1864.

RED WINES.

12 "Patience" (W. Piper), Marangah.—Shiraz, 1865.
4 "Perseverance," Marangan.—Hermitage, 1864.
41 Ditto ditto Malbec.
102 Reid, Curtis, Reidsdale.—Muscat.
59 Richmond, John, Beechworth.—Hermitage, 1863.

WINES OF THE VALLEY OF THE MURRAY PROPER AND FROM THE VICTORIAN SIDE OF ALBURY.

The decomposed granite, trap, and drift gravel, uniting with every variety of situation and exposure, shelter from the extremes of heat and

cold, especially from the hot winds, conspire to render this district the Australian equivalent of the far-famed Cima do Douro of Portugal. The one thing which seems to be deficient in the soil is *lime.*

There is then no wonder that the vines should flourish in these districts, and that their produce should be rich in all those ingredients which go to form wines of the Port and Roussillon character.

Honourable Mention.

WHITE WINES.

23 Moody, Fredk. A., Upper Murray.—Riesling, 1865.
36 Ditto Barnawartha.—Gouais.

RED WINES.

10 Marie, Moorewatha.—Hermitage, 1866.
— Moody, Fredk. A., Barnawartha.—Burgundy.

WINES FROM THE SISTER COLONIES.

WINES OF NEW SOUTH WALES.

The wines of the parent colony were represented at the Exhibition by the produce of about seven districts, and those for the most part, if we except Albury, within one hundred miles of Sydney. Some reason may be found for the paucity of exhibits in this important article if it be remembered that the interval between the time at which New South Wales consented to be represented at all in Melbourne, and the proposed or even actual opening of the Exhibition, was very short, and barely allowed of such samples being sent as were already in perfect condition. Moreover, the same shortness of time prevented that full knowledge of the preparations in progress of being made in Melbourne for the cellaring of a delicate production of this nature from becoming generally known among the New South Wales vignerons. Had that colony entered heartily into the scheme of the Intercolonial Exhibition from the beginning, and diffused all reasonable information throughout the country, there is no doubt but there would have been a far more extensive and varied display of her wines.

The following particulars are taken out of the statistics of New South Wales, for the year ending 31st March, 1866, published by the Registrar-General. In that colony the total number of acres under vines was 1639:—

No. of gallons of wine made	168,123
Do. do. brandy	1,439¼
Grapes exported and for table use (cwts.)	11,193

It is evident from the above, considering the many years which have elapsed since the vine was first introduced, that the cultivation of it has made but very slow progress.

As New South Wales is the parent of all the Australian colonies, so is Camden—the seat of Sir William Macarthur—the parent vineyard of Australia. The name of Macarthur must go down to posterity with honour as

the pioneer and planter of two vast interests—wool and wine. It was for them that Mr. Busby travelled, and made a famous collection of vines all over the best wine countries of Europe; and to this journey we owe his very useful little book. From this collection nearly—if not quite all—the vines in New South Wales have been obtained, and a very large share of the Victorian and South Australian plants.

Medals.

WHITE WINES.

22 Fallon, James, Albury.—Riesling, 1865.
44 Ditto ditto Tokay, 1865.
167 Lindeman, H. J., Cawarra, Gresford.—Cawarra.
60 Wyndham, Messrs., Dalwood, Hunter River.—Dalwood White, 1862.
— Ditto ditto Dalwood White, 1865.
156 White Buculla.

RED WINES.

150 Doyle, J. F., Kaludah.—Red.
155 Ditto ditto Muscat.
128 Ebsworth, O. B., Sydney.—Red, 1860.
29 Fallon, James, Albury.—Hermitage, 1863.
103 Jenkins, Dr. R. L., Nepean Towers.—Verdeilho, 1864.
104 Ditto ditto Verdeilho, 1865.
116 Macarthur, Hon. J. and Sir W., Camden.—1858.
44 Ditto ditto Riesling, 1856.
120 Ditto ditto 1864.
130 Ditto ditto Red Muscat, 1851.
154 Ditto ditto 1853. First bottle was awarded a medal; second and third were bad.
149 Wyndham, Messrs., Buculla.—Red, 1863.

Honourable Mention.

WHITE WINES.

157 Doyle, J. S., Kaludah.—White, 1865.
118 Ebsworth, O. B., New South Wales.—1863.
49 Fallon, Jas., Albury—Brown Muscat.
2 Wyndham, Messrs., Dalwood, Hunter River.—Dalwood Riesling, 1862.
7 Ditto ditto Dalwood Riesling, 1863.

RED WINES.

75 Adam, E., Grafton.—Red Wine.
77 Ebsworth, O. B., New South Wales.—Red Wine.
117 Ditto ditto 1860.
151 Ex. 11-3, New South Wales.—Red.
129 Macarthur, Hon. J. and Sir W., Camden.—Red, 1864.
— Nixon Brothers, Murrumbidgee.
119 Whitehand, W., Wagga Wagga.
127 Ditto ditto
43 Wyndham, Messrs., Dalwood, Hunter River.—Red Dalwood, 1865.
134 Ditto ditto Dalwood Claret, 1865.

The samples from Grafton seemed to have been injured by the badness of the corks; they were also far out of condition, and therefore could not be fairly judged.

WINES OF WEST AUSTRALIA.

It is to be regretted that no information has been obtained as to the country from which the vines of West Australia were originally obtained. The wine interest of this distant colony was represented by about ten samples, which seem to have been supplied from the neighbourhood of Freemantle and Perth. They were very interesting, as exhibiting, especially in the white kinds, the leading characteristics of the strongest wines of the south of Spain and Madeira.

Owing to some unknown cause, unless the corks or bottles were to blame, nearly all had the same peculiar and offensive odour when first opened, but which passed off in the course of a few hours, and they then became also more agreeable to the palate. The white wines from Garden Hill Vineyard were chiefly of a Sherry or Madeira type.

Medal.

RED WINES.

131 Hardy, Joseph (No. 1), Western Australia.

Honourable Mention.

WHITE WINES.

26 Clifton, Mr., Western Australia.—Verdeilho, 1859.
48 Waylen, Dr., Guildford, Western Australia.—Muscatel, 1865.

SOUTH AUSTRALIAN WINES.

None of the sister colonies showed nearly such large and varied exhibits in Wine as South Australia. This colony may now be regarded as one of the wine-producing countries of the world. It is the industry to which, after grain crops and mining, the largest amount of capital and labour is devoted. Here the vineyards will average, for forty miles around Adelaide, at least thirty acres each; some exceeding a hundred acres, and many attaining to fifty. The whole of the country about the capital seems formed to be the home of those vines which nature has destined to produce strong, generous, full-bodied wines. The produce of several vineyards, visited last autumn by your Reporter, seemed to want nothing but the experience and skill of the Portuguese Feitor and Spanish Capitaz to turn out as good wines of the Port and Sherry character as most now obtainable from Europe. If as much well-directed care and attention were bestowed on studying the true nature and capabilities of the *musts* as seems to have been expended on striving to force them to yield wines of a French or German character, the produce of South Australia would ere now have acquired even a better name than it enjoys. In South Australia nature herself is opposed to the production of thin, high-bouquet wines. Here she demands consideration for body, sweetness, spirit, and the other high qualities of generous wines. The Riesling and Verdeilho, when not tortured, yield wines second only to the Bucellas of Lisbon and the sweeter kinds of Madeira; while the Donzellinha,

the Black Portugal, the Scyras, Mataro, and Grenâche yield wines of the character of good Port, such as it is known in Portugal, and the strongest of Hermitage, and that peculiar produce known as Roussillon.

The subjoined particulars have been extracted out of the Registrar-General's published returns of this branch of agriculture for the year ending 31st March, 1866 :—

Total number of acres under vines	6629
Number of vines planted	7,361,863 = 1100 = /ac
Wine made (gallons)	839,979
Grapes exported and used in the country for table purposes (cwts.)	31,707

Without in the slightest degree wishing to introduce a reflection of a political nature, yet in the interest of colonial wine an expression of regret may be placed on record, that while this colony spends so much money on the purchase of wine every year, so little of the superb produce of South Australia should find its way into our market. It is unaccountable except on the ground of the established habits of the Victorian people, and a want of more full and complete knowledge of what pure, fine wine really is.

Among the many exhibits, the wines of Mr. Gilbert, of Pewsey Vale, and the very extensive collection of Mr. Peake, of Clarendon, Mr. Smith and Son, of Yalumba, Mr. Green, of Gawler Park, Mr. Auld, and Mr. Gillard, deserve especial mention, for they commanded the most marked attention of the jury.

It is noteworthy that the blended wines from South Australia were quite below those made from a single variety, or at most two varieties of grapes. This branch of wine treatment requires much more study on the part of makers before it can be styled a success. From this sweeping censure, however, the Highercombe red and white mixtures of four kinds, and the white Auldana—also a blended or mixed wine—must be exempted. In their several kinds they proved very good after standing for six months; but at the time they were opened by the judges, in the very hot weather, and after they had stood only about three months, they seemed to be sick. If the Highercombe wines did not obtain medals, it was owing mainly to the determination of the jury not to alter an award once made.

Medals.

WHITE WINES.

62 A. B.—White, no history; merely the two letters on a bit of foolscap paper. A magnificent wine.
170 Auld, P.—Verdeilho and Riesling.
28 Gilbert, J., Pewsey Vale.—Verdeilho, 1860.
65 Ditto ditto Verdeilho, 1860.
3 Green, W., Gawler Park.—Riesling, 1862.
33 Greig, A., Dirleton.—Verdeilho and Frontignac, 1864.
66 Hunt, F. R., Yantaringa.—Madeira, 1865.
21 Peake, E. J., Clarendon.—Riesling, 1866.
31 Ditto ditto Verdeilho, 1864.
35 Ditto ditro Gouais, 1864.
73 Ditto ditto Pedro Ximenes, 1863.
73 Ditto ditto Doradilla, 1866.
73 Ditto ditto Pedro Ximenes, 1861.
65 Randall, D.—Riesling.
62 Smith, S., and Son, Yalumba.—Sherry, 1864.
51 Winckel, F., Buchsfelde.—White Tokay, 1864.

RED WINES.

89 Gilbert, Joseph, Pewsey Vale.—Red, 1862.
88 Ditto ditto Scyras, 1865.
9 Gillard, J., Sylvania.—Hermitage, 1863.
50 Ditto ditto Mataro, 1861.
8 Green, W., Gawler Park.—Hermitage, 1862.
36 Peake, E. J., Clarendon.—Grenâche, 1864.

Honourable Mention.

WHITE WINES.

54 Auld, P., Auldland.—Mixture.
24 Callender and Co., Auldana.—Riesling, 1863.
25 Ditto ditto Verdeilho.
17 Charlesworth, T. W., Evandale.—Riesling, 1866.
79 Ditto ditto Tokay, 1865.
63 Clifton, W. P., Australind.—Verdeilho.
4 Gilbert, J., Pewsey Vale.—Riesling, 1862.
56 Greig, A., Dirleton.—Verdeilho and Frontignac.
5 Peake, E. J., Clarendon.—Riesling, 1862.
175 Randall, D., Glenpara.—Riesling, 1866.
55 Ross, R. D., Highercombe.—Mixture.
63 South Australian White, A.Z.

RED WINES.

54 Callender and Co., Auldana.—Espanoir, 1863.
30 Charlesworth, T. W., Evandale.—Hermitage, 1866.
51 Fisher, D., Roussillon, S. A.—Mataro and Portugal, 1865.
86 Gilbert, J., Pewsey Vale.—Carbenet, 1858.
100 Gillard, J., Sylvania.—Muscat.
87 Martin, W., Bellevesta, S. A.—Dulcetta, 1864.
31 Peake, E. J., Clarendon.—Malbec, Carbenet, and Shiraz.
35 Ditto ditto Grenâche, 1863.
15 Randall, D., Glenpara.—Shiraz, 1865.
37 Ditto ditto Carbenet, 1863.
53 Randall, W., Randallsen.—Mataro, 1864.
81 Ross, R. D., Highercombe.—1865.
5 Scott, R. and J., Brookside.—Hermitage, 1864.
21 Smith, J., and Son, Yalumba.—Shiraz and Portugal,1863.
24 Ditto ditto Shiraz, 1865.
7 Stead, J., Melon Grove.—Hermitage.
47 Wilson Brothers, Armidale, South Australia.—Mataro.

To the credit of the Intercolonial Exhibition of 1866-7, it must be placed on record that never before in Australia has such a varied collection of wine been brought together. It must also be recorded that, although the Exhibition of 1861 brought many excellent samples to light, the five years that have intervened have not been passed idly by the growers. Five years of colonial experience is a trifle to speak of, compared with the experience of generations acquired by the old wine-producing countries of Europe; yet this short period has sufficed to mark important strides in the right direction. The quality of the various wines sent in to the Exhibition of 1861 your Reporter well remembers, and he can state, without fear of contradiction, that the improvement

made since that period is alike creditable to the energy and enterprise of the growers. The wines sent to London to the International Exhibition of 1862 were thus spoken of by the Wine Jurors at that great gathering, and the following is an extract from their reports :—"The Australian colonies rank next in importance to the Cape in the cultivation of the vine; but owing to its comparatively recent introduction in these countries, the yield is yet very small, and quite insufficient for the home supply, the bulk of the wine used in Australia being still imported from Europe. It is not likely, therefore, that for some years wine can be an article of much export. It is, however, interesting to watch the progress of the cultivation, and to observe the peculiar development of the vine. In this respect there is, as might be expected in dealing with an area almost continental, and considering the numerous varieties of the vine that have been introduced from all parts of Europe, an infinite variety in the produce. We there find wines of the character of the German wines, others again more resembling the French wines, whilst some have the substance and body of the wines of Spain. With care and time, there is every prospect of these colonies becoming the great wine-growing countries of that part of the world."

So favourable a review, by so high an authority, was at that period highly encouraging, and it is not too much to conjecture that if the opportunity had occurred to the same tribunal to sample the magnificent collection forwarded to this Exhibition, without doubt it would for ever have settled the question that this country is destined to enter the ranks with the wine-growing countries of Europe. The value of these important decisions (verdicts, they may be called) are twofold: they not only encourage the growers, but they give a tone to the value of such an industry in commercial circles. Capitalists have not dealt with the growers in any of the colonies to any appreciable extent. In Europe advances are as regularly made upon their produce as upon our wool or our stations, and the security of a good vineyard is considered to be one of the best description. Sooner or later this will be the case here, and when it is so the industry will receive that impetus which capital always gives.

Great praise need scarcely be looked for from the present Paris Exhibition. No collection of wines was sent home officially by the Commissioners from this colony—all was left to the growers. Some few contributed, and many others are not represented at Paris. This is to be regretted, from the national point of view your Reporter judges the capabilities of this industry.

J. J. BLEASDALE, Chairman and Reporter.

The following colonial wines were sold at the Exhibition by the contractors, Messrs. Ellis and Hodgson :—Amontillado, Auldana, Auld's Espanoir, Aucarot, Burgundy, Hermitage, Malbec, Muscatel, Rain's Espanoir, Riesling, Roussillon, Shiraz, Tokay, Verdeilho. The total consumed was 125 dozen bottles. They were purchased from the following firms :—Australian Wine Company, Messrs. Callender and Co., Messrs. Graham Brothers, Messrs. F. A. Moody and Co., and Mr. C. J. Umphelby.

ALE AND PORTER.

Class III.—Section 9a.

GEORGE FOORD, ESQ., CHAIRMAN.

D. S. CAMPBELL, ESQ.
PROFESSOR HALFORD.
WM. JOHNSON, ESQ.
G. C. LEVEY, ESQ., M.P.
S. RAMSDEN, ESQ.
J. WATSON, ESQ.

La bière, qui me plait, n'a point un goût acide.
Sa liqueur offre à l'œil une clarté limpide.
Faite de grains bien mûrs, meilleure en vieillissant,
Elle ne charge point l'estomac faiblissant;
Elle épaissit l'humeur, dans les veines serpente
En longs ruisseaux de sang, nourrit la chair, augmente
La force et l'embonpoint, l'urine accroit son cours,
Et du ventre amolli se gonflent les contours.

The occasion of reporting on the several samples of Beer shown in the first Intercolonial Exhibition affords a fit opportunity for presenting a few prefatory remarks concerning the brewer's materials and method and the products of his manufacture.

As any sound and palatable fermented malt liquor would, in common terms, be characterized as good beer, and as there are so many varieties which would be thus designated, it is not the easiest task to define precisely those properties upon which the excellence of ale or other malt liquor is dependent. The following qualities, however, may be mentioned. Good ale should be bright and sparkling; it should contain, dissolved, enough carbonic acid gas for throwing a light head, but not so much as to render it frothy; it should bead like champagne, and should have an odour at once aromatic (of the hop) and vinous; it should possess a very slight degree of acidity, and should contain a body in proportion to its vinous strength—that is to say, a residue of unfermented sugar and extractive—but no remnant of yeast or of those nitrogen-containing constituents of the malt upon which the growth of the yeast is sustained. In its flavour, that of the alcohol, the result of fermentation, and of the sugar, as well as the small proportion of free acid, should be recognisable; and the delicate, fragrant bitter of the hop, as well as that due to the high roasting of the malt, should be also prevalent; but the coffee-like taste of burnt malt should be altogether absent. There should be no unpleasant after-taste, no persistent bitterness due to the yeast or derived from sources other than that of the hop, and no taint due to decay of the yeast during the fermentation. The colour may vary from a rich amber to a decided straw tint, although fashion will occasionally require that ales should be even paler than this. For light ales the hop should be of the very highest quality, while for strong ales, whose characters are more dependent on the malt constituents, this high quality of the hop is less imperative.

Good beers of the porter class should possess many of the preceding characters. Usually more nourishing, less delicate in aroma or flavour, with more of the empyreuma due to high roasting or even charring of the malt, with a coarser hop, the chief features of its excellence will consist in its having a light, creamy, brownish head, a full body, and a clean flavour, free from all yeasty taint. The hop flavour should not remain on the

palate, and the beer, though brisk, should be void of all tendency to renewed fermentation. When viewed through small thicknesses, it should be bright, and of a brown rather than a red colour.

Thus far these observations apply to beers brewed entirely from malt and hops. When (about twenty-two years since) the price of malt in England rose to about 90s. per quarter, an Act framed for the relief of the brewer allowed the use of sugar in the manufacture of beer, and from that time both raw and burnt or caramelized sugar have been in use; and on that account we are bound to consider sugar as one of the proper constituents of beer. Nevertheless, it must be confessed that malt beer is in a great degree superior to sugar beer, and that beer properly brewed entirely from malt is more nutritious, and generally more beneficial to the system, than that which is brewed from a mixture of these articles. Malt beer is more palatable, for with malt a higher flavour can be obtained; and consuming malt beer as an aliment, we take advantage of the high percentage of phosphates in the mineral constituents of the barley: a fact well indicated by the general recommendation of porter for the use of nurses. Further, porters whose colours are obtained by the use of brown and high-dried malts are better than those for which a black malt is used; for black malt is malt roasted as coffee is roasted, and inferior or partially-damaged grain will answer for this purpose, just as any coarse kind of sugar is suited for the preparation of burnt sugar or caramel. When we use brown malt, we employ that which is susceptible of fermentation; but these charred grains and sugars answer little purpose beyond that of giving colour, besides imparting an undesirable flavour. Excess of black malt gives a coarse taste to the beer, and caramel, although tasteless when pure, is too often accompanied by an unpleasant bitterness.

For brewing good beer certain conditions are indispensable; the brewer must command efficient plant, he must have good materials and suitable water. To pay first a passing attention to the materials, it is to be remarked that the brewer distinguishes several varieties and qualities of hops; there are those which are stronger, and other more fragrant kinds, and he either selects or combines these in use, so as to obtain a definite result. The yellow, dusty, so-called lupulin cells, observable on the base of the leaves of the newly-dried hop, are, when first collected, fragrant with essential oil. These catkins, or hop flowers, dried on a grill in an oast or brick tower-shaped oven, over a charcoal fire, are finally bleached by the addition of a little sulphur thrown upon the coals, and as they are dried they are packed and pressed. Some hops are from the commencement finer than others, but new hops are always more fragrant than old hops, for, notwithstanding the hydraulic pressure to which the hop pockets or bags are subjected, a gradual oxidation and some evaporation of the essential oil of the hop takes place, and the resin resulting from this oxidation, though no longer possessing the aroma of the oil, has the bitterness and other properties for which the hop is valued. Hops of a year old, called "yearlings," are already in this respect greatly altered from their original state, and year by year a further deterioration is suffered until at last nearly all their virtue has decayed. To the resin of the hop is very commonly ascribed narcotic properties comparable to those possessed by the opiate principles of the poppy; while their tannin subserves important functions during the boiling of the worts, and in the final fining of the beer.

For good malt we must have a good well-grown barley. By steeping this grain until it swells and becomes tender, and afterwards spreading the soaked and drained grain in a couch, or heap, germination is artificially induced. The mass now heats, the rootlets are seen to sprout from the base of each grain, while the plumule growing along under the husk, from the rootlets to the opposite end, would there break through the cuticle of the grain, were it not that the maltster, watching the operation until the plumule has attained about three-fourths of the length of the seed, stops all further progress of the germination by kiln-drying, and finally heating so as to destroy vitality and prevent further growth. Of course, there is a loss of weight as the result of this change; the little plant awoke into existence is fed at the expense of the nutriment stored in the grain, the starchy substance of the latter is gradually converted into sugar, which would be consumed as further nutriment of the young plant, if the growth were not checked at that point at which a sufficient change of starch into sugar, with the least possible waste of the resulting sugar, is secured. This chemical change, induced by the germination, is further promoted in the drying, and finally carried yet a stage further in the mashing operation of the brewer.

By the malting process the grain of the barley increases to the extent of one-half, and oftentimes even two-thirds of its former bulk, but at the same time it also becomes softer and more friable. As to the loss of weight which it suffers—allowing that the brittle dried rootlets which have been developed by the germination are separated, then for dry barley and dry malt resulting from the barley, we have a total loss of 8 per cent., the rootlets forming of this loss $4\frac{1}{2}$ per cent., of the original weight of the grain. This total loss is thus divided:—

*Loss in steeping	$1\frac{1}{4}$	per cent.
Do. during germination	3	,,
Do. by separation of the rootlets	$3\frac{1}{4}$	,,
Total loss on original weight of the grain ...	8	per cent.

The mineral constituents of well-dried malt are a little over 3 per cent., and to show how rich these are in phosphates, the following analysis of the ash of barley may be quoted:—

†Potash	13·75
Soda	6·75
Lime	2·21
Magnesia	8·60
Oxide of iron	1·07
Phosphoric acid	38·80
Sulphuric acid	1·17
Silicic acid (of the husk)	27·65
In	100·00 parts of ash.

The silicic acid of the foregoing analysis contitutes almost or entirely the flinty glaze of the husk, and leaving this out of the question it will be seen how very large a proportion of the whole is constituted of the phosphates, even when compared to the entire weight of the malt. The more these are carried into solution in the beer wort the higher becomes its nutrient quality, and hence a feeble acidity, so common an attribute of good beer, may be considered advantageous as contributing towards this

* Mulder. De la Bière.
† Analysis by M. Koechlin. Pelouze and Fremy. Traité de Chemie.

end. But the physiological bearing of these phosphates, which, after all, are only in part dissolved in the mashing, is forcibly shown in the common practice of turning over the exhausted malt, or "grains," to the dairyman, who fully recognises its usefulness, and especially its milk-generating value.

The temperature at which the malt is finally dried modifies its flavour and determines its colour. Until the moisture is almost exhaled from it the temperature is kept at from 90° to 100° Fahrenheit, but finally this is raised to from 145° to 165° Fahrenheit, according to the colour which it is desired to produce. The following table shows the result of experiments on this subject by Combrune. His temperatures are here converted, for the sake of uniformity, from the centigrade to the Fahrenheit scale. In accepting the results, it is necessary to remember that temperature is not the only circumstance affecting the final colour of malt, which is more or less modified by rapidity of drying as well as by other circumstances :—

Malt finished at	124°	retained its	white colour	
,,	129°	became of a	pale yellow colour	
,,	134°	,,	amber	,,
,,	138°	,,	deep amber	,,
,,	143°	,,	pale brown	,,
,,	152°	,,	brown	,,
,,	157°	,,	deep brown	,,
,,	162°	,,	deep brown, locally black	
,,	167°	,,	dark brown colour	
,,	171°	,,	deep coffee brown colour	
,,	176°	,,	black	,,

While for malting a soft water is considered beneficial, for brewing, on the other hand, a more or less hard water (as long as its hardness is of the right character, that due to gypsum or generally to calcareous salts) is on the whole most advantageous. A few words will explain this; those substances containing nitrogen—the protein compounds, such as vegetable albumin—which are so prone to change, which constitute a pabulum for the growth of the yeast, and which generally concern that class of bodies known as ferments, are abundant in malt. In ordinary malt there is more than enough of these substances for carrying the fermentation to its utmost verge, and indeed far beyond the requisite point; and hence with a water which is hard, and which consequently is less solvent of these particular principles, we obtain a wort in which we can complete our fermentation, still leaving a body of unfermented saccharine and extractive substances, and at the same time conferring on the beer, in a greater or less degree, the stability and other general characters of a malt wine. Beers brewed with these waters go through a regular fermentation and come to a definite close; they do not become "fretful," for, having eliminated all excess of the food of the ferment, these capricious and vexatious qualities are thereby removed.

But temperature—especially the temperature of the fermentation—has much to do with the character of permanence belonging to malt liquors. As a general rule, the lower the temperature at which they are fermented the more permanent will they prove; but no attention to temperature can in itself command that equality of results which obtains when the protein compounds of the malt—the diastase and albumin—are dissolved in a limited but sufficient quantity; and when the several stages of the

fermentation are modified and controlled by the nature and degree of mineralization of the water used in brewing operations. The efficacy of gypsum in this respect is illustrated by a remarkable example—that, namely, of the Burton ales. Their stability, uniformity, and, in short, general excellence—even that of the light ales of Burton—is proverbial. David Booth, in the year 1829, published the second part of his *Art of Brewing*, and in that treatise he stated (we are writing in general terms only) that ale like that of Burton might be produced by the addition of gypsum, &c., to the finished worts. This so far roused the honest jealousy of the Burton brewers that action at law was commenced against the publishers of the pamphlet; and in evidence it was clearly shown that the Burton ales were genuine, and that their flavour and properties resulted from the peculiar quality of the natural water found at Burton, and the mode of brewing there: it was shown that the springs of Burton ran over a gypsous rock, which gave them this natural mineral impregnation. At the close of this trial, which, originating in a mistake, came to a happy conclusion, Mr. Brougham stated—"That we are satisfied that there is nothing deleterious in the matter with which the water is impregnated." To which Lord Tenterden observed: "Very well; the lovers of Burton ale may now drink it without fear?" Mr. Brougham: "If they drink it in moderation." Lord Tenterden: "Let the rule be discharged."

Good ale or porter may be brewed on either the large or the small scale, but the large scale, besides that economy which belongs to methodized manufacturing operations, is on the whole more certain in its results; large bulks of fluid offering proportionally less surface than small bulks, are less subject to those vicissitudes of temperature which are due to atmospheric causes. The modern brewery in its highest development is a masterpiece of order, method, and convenience; it is usually ranged in several stories, and due attention being paid to hydrostatical principles, there is no unnecessary lifting of any of the materials. The coppers, usually of vast capacity, reach from the lower to the upper stories, and the water, which the brewer always, for some occult reason, takes care to call "liquor," whether obtained from wells or other supply, is raised by pumps or otherwise to backs, or cisterns, on the roof. The malt and hops are stored in the upper lofts, and the malt rolls or cylinders are placed so high up in the building that, while convenient for receiving the malt, they are no less so for delivering it bruised into the grist case over the mash-tun. In its passage through these metal rollers every grain must have its skin broken, but beyond this there is no absolute necessity for further crushing. The mash-tun, situated near the hot water or "liquor" copper, is a vast piece of cooperage, furnished with covers, and with a perforated false bottom; into this vessel the grist, or bruised malt, is let down, and on this grist (which by this change of its position is now technically known as "goods") the hot water is run in from the "liquor" copper. In doing this, with the object of raising the temperature of the tun to a certain definite degree, a due allowance for the cooling effect of the tun and its contents is made; but at whatever heat the water is run in, it is imperative that the temperature at which starch gelatinizes (say 162° Fahrenheit) shall not be reached. To gelatinize the starch of the goods is to "set the tun"—that is to say, to bring the whole contents of the tun to a state which is virtually that of stiff starch, and thus to prevent the possibility of easily running off the worts. This setting of the

tun is the *bête noire* of the young brewer. To the mash-tun pertain two contrivances, which may be either separate or which may be combined into one instrument, the precise form varying according to the mechanical skill brought to bear in each instance. These are the mashing machinery, a contrivance of rotating arms, which mix, toss, and to some small extent masticate the grain ; the other is the sparging tackle, a series of tubes, finely perforated, and which sprinkle a misty spray evenly over the entire surface of the goods in the tun. The mashing machinery is turned by mill gearing, and in some of its forms it includes, as we have stated, ingenious combinations of the sparging appliances. In the mash-tun the operations are two-fold—namely, those of chemical conversion and those of solution. The conversion may be considered as a continuation of the changes which attend the malting process. The starch and dextrin of the malt are converted through the agency of a kind of natural ferment in the malted grain (the diastase) into sugar, and this sugar, with certain nitrogen-containing constituents of the malt, and with a portion of its mineral constituents, is dissolved in the water, forming a wort. The whole operation in the mash-tun is a well-regulated succession of mashings and spargings, continued until all that is soluble and useful for brewing good beer is extracted. The exhausted "goods," now called "grains," are lifted from the tun by the contractor, and handed over to the dairyman.

The worts, after the first mashing, and during the sparging, are continually running into the underback—a large square wooden back, or vessel, situated directly under the mash-tun. Here the wort defecates itself by subsidence, and from this, flowing into the pump reservoir, it is pumped up and thrown into the hop copper, and then, with addition of hops in the proper proportion, it is boiled. The boiling of the wort effects several important results. The wort is concentrated by evaporation ; the effective constituents of the hops are dissolved out by the wort ; and, when the boiling has been carried on sufficiently long, a flocculent precipitate is produced. This latter change is known as "the breaking of the wort ;" and when this breaking has taken place, we have a fluid at once bitter and sweet, the flocks in which will immediately subside, leaving this hopped wort quite bright. The brewer mashes in such a way as to produce usually two worts, and the first is up in the copper, and boiling, while the second wort is running from the tun. This arrangement, besides other advantages, enables him to brew two, three, or more separate strengths of ale in one gyle, or batch, for, knowing pretty closely what his malt will yield, and ascertaining the weight and bulk of his hopped first wort, he is enabled to run this into the several fermenting squares to such guage-marks as will, with addition of suitable proportions of the second worts, constitute mixed worts of the several original gravities required. The calculations involved are simply those styled alligation in the common arithmetic books, and a certain control over the method is afforded by varying the degree to which the second wort is evaporated. When the first wort is sufficiently boiled, it is run off into the hop-back, and the second wort is immediately pumped into the copper in its place. Then the first wort having settled, and being strained by the aid of a perforated false bottom in the hop-back, is pumped up to the coolers, or refrigerators ; the hops are immediately returned to boil with the second wort, and thus the second wort follows one stage behind the first through all the operations.

In the coolers the wort is lowered in temperature partly by exposure

to the air in a thin layer, and partly by fans rapidly revolving. In refrigerators the wort passes through a system of metal pipes over which a current of water is caused to flow constantly in an opposite direction. The refrigerator is regarded by many as a safer system than that of the old-fashioned coolers, and this opinion is based on the idea that the exposure of so large a surface of the warm worts in the latter is liable to induce an undue acidity in the finished beer. How far this exposure in the coolers may be injurious it would be beyond prescribed limits to discuss in this place; we may, however, add that the two methods are often combined, and that recently improved means of refrigeration, involving those principles utilized in ice-making machinery—namely, those which take advantage of the cold resulting from evaporation at low pressures, have been adopted with highly satisfactory results.

To the mixed worts in the squares at 60° Fahrenheit, or a few degrees over, the yeast is now added, and evidence of the fermentation is very soon observable. A thin creamy head is first formed, this increases in quantity, rises, breaks into rocky masses like miniature foam on a troubled sea, the head curls over and falls together, and now a seething noise is audible. During its progress the fermentation is watched by the thermometer and saccharometer; if the temperature is rising too high, a tinned copper worm is lowered into the squares, and the temperature is reduced by the circulation of cold water through the worm; the wort is also occasionally roused or agitated. Finally, when nearly sufficiently attenuated, the yeast is skimmed off, and the new beer is pumped or run into another vessel; from this it finally passes into barrels, where, the last stage of fermentation still proceeding, the barrels are kept filled up, while all overflowing of yeast and beer is collected in troughs and thence conveyed into a proper receptacle by shoots. When the fermentation has almost or quite subsided, the beer is fit for sale or storeage.

As the fermentation takes at least several days, it will be understood that many brewings are in progress at one time—that, in short, new brewings are from day to day following up the more advanced ones. In this all confusion is avoided by the system of the brewer, and by the use of two or three simple tools or instruments, concerning which we will now offer a brief explanation. First, there is the gauge-rod, a simple square rod, graduated to inches and furnished at one end with a cork float. All the tuns, coppers, backs, and fermenting squares being gauged, a book is constructed showing the capacity of each vessel from the bottom upwards for every inch in depth, as shown by the gauge-rod. The brewer, carrying the little gauge-book as a pocket guide, and with gauge-rod in hand, can measure out of or into any vessel a known number of gallons or barrels; he can also give specific directions for the mixing of worts in the simplest manner and with the most certain results. With the thermometer he can with the same certainty direct and manage all temperatures, those of mashing as well as those of the fermentation; and as these temperatures are sometimes regarded as trade secrets, he can, if he should think fit, set a blind thermometer, having a clamping index and movable scale, for the use of the men. By means of the saccharometer, which is no more than a particular kind of hydrometer, he can ascertain the specific gravity of his worts and beers through their several stages, and determine the precise point at which their fermentation is to be arrested. One of the most useful forms of this instrument is of brass, with hexagonal or octagonal stem; each face of the

stem is engraved with a separate scale, and the scales are arranged each one for a particular temperature, and following in a series at intervals of 5° Fahrenheit. The most common form of scale indicates pounds per barrel, but this requires a little explanation, which will be best conveyed by an example. A barrel of water, of 36 imperial gallons, weighs at 60° Fahrenheit exactly 360 lbs. avoirdupois; and it is the weight in excess of the weight of water—that increased specific gravity which is due to the extract of malt and hops—which the brewer's saccharometer scale is marked to indicate. With wort weighing 392 lbs. per barrel, the scale is marked to indicate 32 lbs., which is the excess weight over the 360 lbs., the weight of a barrel of water; and in using the saccharometer, the brewer is always guided, by the prior use of the thermometer, to the selection of that side of the stem divided for the particular temperature which the wort under trial may happen to have, and the indication of the instrument is read off from that scale. The sampling-rod completes the brewer's tools. Its use is implied by its name, and it need not be further described than by the statement that it is a wooden rod, armed with a tin cylinder suitable for dipping and transferring samples.

But returning for a short space to the subject of the saccharometer, a little further explanation will afford a just view of the significance of its indications. On first glancing at the subject it might be supposed that wort weighing 370 lbs. per barrel, or 10 lbs. more than the weight of a barrel of water, would contain exactly 10 lbs. of extractive matter, and that on evaporation it would leave a residue of 10 lbs. of solid extract. If this were really the case, the indications of the saccharometer would be both simple and direct; the case, however, is otherwise, and in accordance with the following explanation. The several kinds of sugar, and other substances of allied nature, are composed of carbon, hydrogen, and oxygen, *the two latter elements being in the same proportion to each other as that in which they form water*, so that these sugars, &c., may be regarded as compounds of carbon and water. This malt sugar consists by weight of—

72	parts of Carbon,	or per cent.	40	parts.
12	,, Hydrogen	,, ...	6·67	,,
96	,, Oxygen	,, ...	53·33	,,
In 180	,,		In 100·00	,,

The proportion of the hydrogen to that of the oxygen being as 1 to 8, as it is in water. Now it is found, as the result of close observation, when 100 parts of malt sugar are dissolved in 900 parts of water, making 1000 parts by weight of solution, that two results of an opposite character have taken place. The solution is increased in bulk, very nearly, but not quite, as if a quantity of water equivalent to the oxygen and hydrogen of the sugar had been added to it; and thus increased, it is also increased in specific gravity very nearly, but not quite, as much as would be equivalent to the weight of the carbon in the sugar. Thus, 900 of water + 6·67 of hydrogen + 53·33 of oxygen = a bulk of 960 of water, and $\frac{960+40}{960}$ = a gravity of 1·04166. As ascertained by practical trial, the gravity in this instance is stated at 1·04, so that the increased gravity of a wort, considered as carbon, affords a means for calculating pretty closely the quantity of extractive matter of the malt, or the quantity of sugar which it represents. With cane sugar, grape sugar, caramel, dextrine, with the worts of

both pale and brown malts, even with the extractive left after distilling the alcohol from a finished beer, the carbon is thus approximately represented by the increase of specific gravity over that of water. When, however, we examine the question more critically, we find slight deviations of gravity among the substances above indicated. For instance, 21 of carbon in cane sugar is represented by an increased gravity of 20, while in starch sugar it is represented by an increase of 21.*

Having thus slightly described the brewer's plant and tools and his general routine, a few words concerning the nature of the brewing operation, and especially of the fermentation, may be added. Vital operations —those of growth, for instance—are very commonly attended by changes of a chemical nature; and in brewing the chemical changes which take place are, to a considerable extent, such as may be brought about as consequences, or at least as concomitants, of vital processes. As in malting we effect a chemical change in the live seed as the result of its germination, so in mashing we induce a supplementary and further chemical change by the agency of principles which, if the growth of the seed had not been arrested, would doubtless have come into play for changes subordinate to the development of the young barley plant. We commence by availing ourselves of the chemical change which attends the process of germination, and we arrest this at a point which saves the altered constituents of the seed for uses foreign to the plant growth; in the next place, we further promote these changes during the drying of the malt. Then we effect a secondary chemical change in the mash-tun, expending the residual potency which would have otherwise belonged to the vitality of the seed: and when we have rendered the malt constituents soluble by these successive changes, we have arrived at a point at which it is desirable still further to alter the chemical nature of our solution, or wort. We effect this, not by purely chemical means, not by the exhibition of acids, or other similar reagents, but having already expended the vital force of the grain, we now superadd from without a new organic force, and once again avail ourselves of chemical changes induced by a vegetable growth. We add yeast—that is to say, the yeast plant, or fungus—and by its growth in our wort we induce a class of changes, including that from sugar into alcohol and carbonic acid gas—changes parallel with the growth of the yeast plant, and which finish when all the nitrogenous pabulum, so necessary for the growth of yeast (for all fungi are remarkably rich in nitrogen), is assimilated. When our fermentation is complete, the thing done amounts to this—namely, we have progressively effected a series of chemical changes in substances of organic origin, and chiefly by the aid of vital processes artificially promoted; and we have deflected the products of the change from their ordinary natural channels (those of sustaining the young plant until it is able to cater for itself in the soil), devoting them to other purposes, to those of supplying a quickly-assimilable, highly-nutritious, and moderately-stimulant fluid aliment—beer, in fact.

In the mash-tun, the agent which effects the completion of the change of starch and dextrine into sugar is a peculiar substance, which has been

* The reader wishing to inform himself more particularly on this subject should consult Professors Graham, Hofmann, and Redwood's report upon "Original Gravities," in the fifth volume of the *Journal of the Chemical Society of London*, 1863.

named diastase, and which appears to be derived from some modification of the albuminous matter of the barley. This diastase has the remarkable property of converting into sugar a much larger quantity of starch than that which the grain itself contains; hence, in the preparation of the extract, the malt may be mixed with a certain quantity of raw barley, or other grain. In Belgium, large quantities of beer are prepared upon this principle from malt mixed with potato starch.* It may be useful to state that this change of starch into malt or grape sugar, and of cane sugar into malt sugar, can also be brought about by chemical means, as by the use of mineral acids: starch and sugar, in the chemical potential sense, are very nearly identical, and starch requires very little chemical prompting for passing from the starchy to the saccharine condition.

The yeast plant, as we have already stated, is a fungus, containing a large proportion of nitrogen; its ash is also remarkably rich in phosphoric acid and potash, and in this sense closely comparable to the ash of barley, so much so that our wort prepared from barley malt is exactly that kind of fluid in which this particular kind of microscopic plant can flourish. Assimilable nitrogen, phosphorus, and potassium compounds are essential to its growth, and in our wort these conditions are amply fulfilled. Observed under the microscope, by placing a very minute particle of yeast in a drop of new wort, the yeast fungus is seen to be a little egg-shaped cell of about the $\frac{1}{2500}$ of an inch in diameter. In the ordinary mode of fermentation (that, namely, which is conducted at temperatures varying from 68° to 77° Fahrenheit) it increases by budding, but at a lower temperature (44° to 46° Fahrenheit) the propagation by budding is replaced by the internal growth of younger cells, and the rupture of the outer envelope as these young cells mature. All this may be watched by placing one or two of these objects under the microscope, in the proper fluid between glasses, and regulating the temperature of the apartment.

In Bavaria there is in use, besides the ordinary mode of fermentation, another singular modification of it. The wort is fermented in shallow vessels, placed in cellars, thus keeping a low temperature, and causing the fermentation to proceed very slowly. In this process the growth of the yeast takes place, and carbonic acid is evolved as in ordinary cases, but the yeast and carbonic acid part company, the yeast remaining at the bottom of the fluid and the carbonic acid rising through it. The propagation of the yeast in this case is by internal growth, and its character is generally so far modified that for producing this particular kind of fermentation it is better suited than the ordinary variety. The beer brewed by this Bavarian method has distinctive and valuable characters, especially that of permanence; but a slow fermentation, like the storing of beer, has the disadvantage of locking up the brewer's capital, and is, therefore, so far opposed to his object, which is that of turning his capital over as quickly as possible.

From a chemical point of view, we may regard fermentation as a change or decay, allied in its nature to putrefaction. When such a decay is accompanied by an offensive odour we call it putrefaction, but when no such odour is evolved it is a fermentation. That the fermentation of wort is accompanied by the growth of the yeast fungus does not oppose this view, for changes of putrefaction and fermentation are most commonly

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* *Dictionary of Chemistry*, 1863, article "Beer."

accompanied and accelerated by the simultaneous parasitic growth of one or more of the lower forms of vegetable or animal life; and it further happens that the several varieties of fermentation—determined by different compositions of the fluids fermenting, by temperature, and other disposing causes—are each of them accompanied by their own proper parasitic growth. For the proper fermentation of our wort there must be present certain nitrogenous bodies, such as albumin, &c., and it is by the proneness of these to decay that food for the growth of the fungus is supplied, while this decay and growth contagiously promote the alteration of the sugar and other similar constituents of the fluid, which, wanting nitrogen, would not otherwise change. In fermentation of beer wort the presence of atmospheric air is necessary during the early stages; this exposure is required for its commencement, but not for its continuance; a body once brought into a state of fermentation by contact with the air, which is charged with spores of a great variety of these ferment fungi,* continues to ferment when afterwards removed from atmospheric influence, provided there is a sufficient amount of nitrogenous matter present, and providing the other external conditions (those of temperature, &c.) obtain. The grape may be taken as an example of this. As long as the skin is sound, it will not ferment; but when once the skin is punctured, fermentation rapidly sets in. The air, charged with germs of the lower orders of both animal and vegetable life, is at all times ready to supply to any fermentable substance a very great variety of these; and that kind which is best suited, best nursed by the temperature, and best fed by the decaying pabulum, soon gains an ascendancy over the others, determining the particular character of the fermentation which supervenes.

In the ordinary treatment of worts, the fermentation is induced by the artificial and abundant addition of the yeast plant. During this fermentation the quantity of the yeast is increased sevenfold, so that after each operation the brewer has sufficient for his future wants, as well as an excess, which he can spare for the use of the baker or distiller. The change suffered by the sugar during fermentation may be expressed generally in the following terms:—The sugar of malt, or glucose, is a compound of carbon, hydrogen, and oxygen, and one atom of this glucose is split up, forming two atoms of alcohol (which is also a compound of carbon, hydrogen, and oxygen) and two atoms of carbonic acid—a compound of carbon and oxygen, the latter escaping as gas, or fixed air. To express this in the most general terms it may be stated that—

Sugar of Malt, or Glucose, consists (by weight) of—		This is resolved by fermentation into Alcohol consisting of—	and	Carbonic Acid consisting of—
Carbon ... 72 parts	...	Carbon ... 48 parts	...	Carbon .... 24 parts
Hydrogen 12 ,,	...	Hydrogen 12 ,,	...	—
Oxygen... 96 ,,	...	Oxygen... 32 ,,	...	Oxygen......... 64 ,,
Glucose...180 parts	=	Alcohol.. 92 parts	+	Carbonic Acid 88 parts.

When cane sugar is fermented it is in the early stage of the process converted into grape or malt sugar, afterwards undergoing the change into alcohol and carbonic acid, just as though starch sugar were used. In the common fermentation of beer worts by far the greater part of the sugar is resolved into alcohol and carbonic acid, although also about 4 or 5 per cent. is converted into glycerine and succinic acid, which compounds must

* On this subject, see Pasteur's papers in the *Annales de Chemie.*

therefore be considered as normal constituents of beer. Amylic alcohol (the characteristic constituent of the so-called fusel oil of the raw grain spirit) can also be produced in the fermentation of saccharine worts; and as this compound is highly detrimental to the animal economy, this fact, as far as it has a practical significance in reference to the production of malt liquors, becomes a matter of no slight importance.* Just as a suitable soil and a proper climate conduce to the vigorous development of a particular vegetation, so the proper beer yeast and the proper alcoholic fermentation are fostered and developed by a proper malt wort and a properly-controlled temperature. In reference to temperature it may be stated that there is a climatology, yet unwritten, of alcoholic drinks; the fact is well expressed by the old-country adage to the effect of beer being "the wine of the north," and by the terms "malt wine" and "barley-wine," applied to the higher class of ales. Where the climate is favourable for the growth of barley, the other conditions being also favourable, the best quality of beer can be brewed. Where, on the other hand, the grape grows in perfection out of doors, there difficulties in managing the fermentation of the beers will be experienced, while everything is favourable for fermenting and maturing the native wines; and, no doubt, there are also physiological relations which make beer the more suitable drink in hardy latitudes, and which apportion the more exhilarant but less nutritive wines to warmer countries. This question of the use of beers as contrasted with that of wines, and that of our capabilities for brewing wholesome malt liquors, is one of considerable national importance.

A curious observation, which bears materially on the subject of brewing in wine-growing climates, is made by Blondeau, who states that in commercial beer yeast the cells of *Torula cerevisiæ* and of *Penecillium glaucum* may be distinguished by the aid of the microscope (the former being ovoid and the latter barrel-shaped). He states that these two fungi may be separated one from the other by washing and filtration, the larger cells of the *Torula* remaining on the filter, *and exciting vinous fermentation when introduced into sugar solutions*, while the smaller cells of the *Penecillium* pass through the filter, and consequently the filtered fluid *excites lactic acid fermentation* in sugar solutions.

The experience of the Jurors of this Section is in conformity with the preceding views; the ales and porters of New Zealand and those of Tasmania are comparable to those of England, while those of Victoria fall far short, on the whole, of any such comparison. The Chairman of this Section, on a recent occasion, examining the yeast of a Victorian brewery, where the fermentations had become admittedly irregular, observed abundant evidence of the presence of the wrong kind of fungi in the yeast, and recently during an investigation concerning colonial beers undertaken for the Royal Commission on the Sale of Wines and Beers Statute, Mr. William Johnson, the Government analytical chemist, and one of the Jurors of this Section, has ascertained the too general prevalence of fusel oil constituents in Victorian ales. As the subject is deserving of the closest attention, Mr. Johnson's notes are appended to this report. The prevalent use of sugar and of sea-borne hops is doubtless so far a cause militating against the quality of our beers, but the difficulties of the climate as com-

* Amylic alcohol is frequently produced in the fermentation of sugar, and, under certain conditions, propylic and butylic alcohols.—*Dictionary of Chemistry*, 1864, article "Fermentation."

pared to those of Tasmania and New Zealand must be regarded as our principal practical impediment. It is to be hoped that the excellent Tasmanian and New Zealand malt liquors may find their way into this market, and that competition with them may stimulate our brewers into the adoption of means for overcoming, as far as possible, the climatic difficulties; for after all there is no foundational difficulty of such a magnitude as to prevent the brewing of first-class ales in this place: for the control of the fermentation it might be conducted in cool vaults under the soil, and for the proper cooling of the worts refined refrigeratory contrivances could be adopted. As to the use of high class malt and hops, to the exclusion of inferior materials and sugar, that is a matter of price and competition. One of the chief uses of these Industrial Exhibitions is to promote a healthful competition, and it is to be hoped that the colony of Victoria on future occasions will be found, in the products of her breweries, to hold her own against all comers.

In the adjudications which follow it is to be understood that the Jurors have throughout relied on the good faith of the exhibitors; their judgment has been formed in each case on the article exhibited, without reference to price or other conditions. On future occasions it may, perhaps, be found desirable to require a formal statement of the locality of the brewery, the materials employed, and the selling price of each exhibit, so that the efforts of the Jurors might be thereby facilitated, and so that a just discrimination, entertaining the question of price as well as that of quality, might be exerted.

GEORGE FOORD, CHAIRMAN AND REPORTER.

NOTE BY MR. WILLIAM JOHNSON.

At the request of the Royal Commission appointed to investigate the mode of working of the present "Sale of Wines and Beer Statute," the writer examined a considerable number of beers, collected under a variety of circumstances and from different sources. This inquiry was considered desirable in consequence of the very frequent accounts that have appeared, from time to time, in the various newspapers, of persons suffering from a species of stupefaction, resembling hocussing, after partaking only moderately of colonial ales, together with partial loss of use of limbs, and some other symptoms not necessary to allude to further. The writer sought in vain for the usual adulterations said to be occasionally used, such as strychnia, picric acid, tobacco, &c.; but, unexpectedly, ascertained that nearly all the beers examined contained variable quantities of fusel oil, the presence of which in quantity in beers is quite sufficient to account for any of the disagreeable symptoms referred to above as sometimes occurring. This discovery was considered so important by the Commissioners that the Government were requested to grant the further assistance of such other chemists as might be in their employ, in order more fully to confirm or refute it; and Mr. J. D. Kirkland, of Melbourne University, and Mr. J. Cosmo Newbery, of the Geological Department, were consequently requested to communicate with the writer, and again examine fresh samples of ales that would be submitted by the Commission. The result of these examinations was that the statement of the writer was fully confirmed, and a report forwarded to the Commission to that effect.

Since this report has been sent in, numerous examinations have been made by the writer on beers brewed in different parts. Amongst these he has found that the Ballarat ales were comparatively free from fusel oil, whilst some in Melbourne contained it abundantly. It was also found slightly in two out of three samples of English ale, being quite absent in Bass's No. 3, and in some samples of Melbourne ale.

It is the opinion of the writer, based upon observation, that the prevalence of this impurity in Melbourne ales is to be referred in part to the extreme softness of the water from which they are brewed, the Yan Yean being in fact alkaline; in part to the insufficiency or want of quality of the hops used, or to the undue length of time they are boiled with the wort, by which the aroma and virtue of the hops are in great measure dissipated; and in part to the very high temperature attained here during fermentation, causing the cellular tissue present in wort to enter the fermentative process, and thus producing the injurious compound alluded to. The *loss* of essential oil of hops which ensues upon long boiling is one very prolific cause of the formation of fusel oil—for when present in sufficienty quantity in beers, oil of hops prevents the formation of fusel oil during fermentation. It will thus be seen that other bitters, such as quassia, gentian, camomile, &c., even though themselves innocuous, cannot be substituted for hops in beer—particularly in a hot climate, and still more particularly when an alkaline water is used for brewing—without great detriment to the quality of the beer, and the formation of large quantities of fusel oil.

Amongst the samples of ales submitted for competition at the Exhibition, the writer, who was commissioned to make the chemical examination, ascertained that the following brands were either entirely free from fusel oil or else contained it in such extremely small quantities as to entitle them to special notice. It is worthy of remark, that all the porters examined were found to be free:—Wilson, Walker, Noakes, Tasmania; Joel, Field, Hooper, Dodson and Aitken, New Zealand; Carlton Brewery; Cohn, Talbot; Wood and Ware; Harrington, Ballarat.

WM. JOHNSON, Government Analytical Chemist.

The following Customs return shows a most satisfactory falling-off in the imports of ale and porter, particularly in draught beer:—

	BOTTLED.		DRAUGHT.
1860	£306,781	...	£304,770
1861	245,283	...	256,015
1862	187,463	...	210,658
1863	264,153	...	208,074
1864	201,919	...	132,281
1865	199,697	...	140,621
1866	215,794	...	84,939

The following is a statement of ale consumed at Intercolonial Exhibition, from 10th October, 1866, to 23rd February, 1867, as taken from the books of Messrs. Ellis and Hodgson, the contractors:—

ENGLISH.—5 hhds. ale, Bass's; 18 hhds. ale, Carlisle.

COLONIAL.—2 hhds. ale, from Terry; 1 hhd. ale, from Wood and Ware; 2 hhds. ale, Standard, Castlemaine; 2 hhds. ale, from Sandhurst; 1 hhd. ale, from M'Cracken; 1 hhd. ale from Aitken; 1 hhd. ale, from Geelong; 1 hhd. ale, from Warrnambool; 1 barrel ale from Carlton; 2 kilderkins ale, Vaughan and Wild.

The following is the List of Awards in this Section :—

MEDALS.—VICTORIA.

248 Carlton Brewery Company, Bouverie-street, Melbourne.—Bulk Ales.
268 Fitzgerald, N., Castlemaine Brewery, Castlemaine.—Fine clear Pale Ale, in the wood.
294 Pearson, George, Condell's-lane.—Colonial Brewed and Bottled Ale.
307 Taegtow, F., Williamstown.—Bottled Ale, styled "Lager Bier."

HONOURABLE MENTION.—VICTORIA.

258 Dickinson, James Henry, Standard Brewery Company, Castlemaine.—Bulk and Bottled Ales.
264 Farrington, C. M., and Co., Ballarat Brewery.—Bulk Ale.
286 Martin, P. J., Australian Brewery.—Bottled Ale.
310 Vaughan and Wild, Smith-street, Collingwood.—Bottled Ale.
316 Wood and Ware, Brewery, Collingwood.—Bottled Porter.

MEDALS.—TASMANIA.

376 James, Wm., Elizabeth-st. Brewery, Hobart Town.—Sound Porter in bulk.
377 Walker, R., Hobart Town.—Fine sound Ale.
673 Wilson, Hon. James M., The Cascades.—Very high-class Bulk and Bottled Ales.

HONOURABLE MENTION.—TASMANIA.

374 Noakes, Mrs., Longford.—Bulk Ale.

MEDALS.—NEW ZEALAND.

60 Harley and Sons, Raglan Brewery, Nelson.—Bulk Ale.
61 Hooper, Dodson, and Aitken, Nelson.—Bulk and Bottled Ales and Bottled Porter.
63 Marshall and Copeland, Dunedin.—Bulk and Bottled Ales, of fine quality.
65 Moore and Co., Canterbury.—Bulk Ales, brewed to compare with English Ales.
66 Whitson and Co., Auckland.—Bottled Ales and Porters.

HONOURABLE MENTION.—NEW ZEALAND.

— Field, Mr., Nelson.—Bulk Bitter Ale.
62 Joel, W. A., Dunedin.—Bulk Ale.

SPIRITS, LIQUEURS, AERATED WATERS, AND OTHER BEVERAGES.

Class III.—Sub-section 9 a.

D. S. CAMPBELL, ESQ., CHAIRMAN.

MATTHEW LANG, ESQ.	JOHN CAMPBELL, ESQ.
J. D. KIRKLAND, ESQ.	J. WATSON, ESQ.

THE Jurors of this Sub-section beg leave to present to the Commission their Report on Spirits, Liqueurs, Fruit Wines, Bitters, and Aërated Waters.

SPIRITS.—The materials available in the colonies for the manufacture of alcoholic spirits include—sugars; the various kinds of grain, including barley, rye, sorghum, maize, &c.; potatoes, yams, and other starch-yielding

tubers; beet, and similar bulbs; as well as wine and the refuse of the vintage. Recently the grass tree has also been proposed as an available material for the distiller. Spirits of merchantable quality made from most of these materials have been shown, and have come under the notice of the jurors in this section.

Brandy.—Of four samples of brandy exhibited, two were of noticeable quality. That of W. M'Donald, from Wangaratta, was the best, and therefore a medal has been awarded to it; that of D. Fisher, of Adelaide, was also considered of sufficient merit for honourable mention.

Whisky.—The samples of whisky brewed from barley, sorghum, and malt, three samples in all, were of fair quality. To that of Thomas Aitken, considered by us to be the best, was awarded a medal; the two other samples have received honourable mention.

Geneva.—Only two samples of this spirit were exhibited; both were of fair quality. A medal was awarded to that of Mr. Thomas Aitken.

The samples of spirits exhibited by Mr. Lumsdaine, Inspector of Distilleries, Sydney, made from barley, sorghum, and treacle, were considered as deserving of honourable mention.

Messrs. John Levy and Sons' spirits, manufactured from beetroot and mangold wurtzel, were considered of interest, as representing a new enterprise, and were awarded a medal chiefly on that account.

The extensive series exhibited by Mr. Lesley A. Moody, the Government Inspector of Distilleries, Victoria, of various kinds of spirits derived from Victorian vineyards, was awarded a medal on account of its interest and general excellence.

LIQUEURS.—Under this head are included a large variety of compounded spirituous syrups, variously flavoured with different essential oils, &c. Although many of these were below average quality, on the other hand some of those recognised in our list of awards may be justly characterised as of a superior class. Conspicuously among the latter may be mentioned those of Mr. Seppelt, of Adelaide.

BITTERS.—Under this head are included the so-called quinine wine, as well as a variety of compounds mixed with aromatic bitters. For our decision of the relative merits of these various exhibits, we refer to the list of awards. The Jurors of this Section are of opinion that indigenous barks, particularly the sassafras, which is both wholesome and pleasant in its flavour, could be beneficially applied to the purposes of this manufacture; and they hope to find in future exhibitions the evidence of their having been generally adopted for this use.

FRUIT WINES.—The numerous exhibits under this head—chiefly from Tasmania—reflected, for the most part, great credit on the exhibitors.

In the liqueurs, as well as the raspberry vinegars and balms, lemon syrup, &c., &c., the Jurors of this Section have throughout distinguished between flavourings derived from the genuine fruit and those artificially derived from the compound ethers, or fruit essences, as they are commercially styled. This distinction has been duly observed in their awards.

AËRATED WATERS.—Under this head are included soda-water, lemonade, gingerade, Seltzer and magnesia waters, all of fair quality. The soda-waters of Messrs. Rowlands and Lewis, of Ballarat, as also that of Messrs. Hattersley and Co., of Yackandandah, and of Mr. P. G. Dixon, of

Melbourne, were of excellent quality. The lemonades exhibited by Mr. E. S. Russom, of Beechworth, as well as those of Mr. P. G. Dixon, of Melbourne, were also acknowledged for excellence. Although samples were exhibited under the style of "Seltzer-water," it is noticed that the natural effervescent springs prevalent at Ballan and other places in the colony have not yet been utilized in accordance with their aptitude for this trade. Careful analyses of these mineral aërated waters would doubtless tend to establish a general recognition of their sanatory and medicinal virtues, and thus lead to the development of their use in a new Victorian industry.

D. S. CAMPBELL, CHAIRMAN AND REPORTER.

The following Customs return shows the Imports of Spirits, &c., for the last seven years, from which it will be seen that a large field is open for colonial enterprise in carrying out distillation on an extensive scale. In properly skilled hands and with the most improved appliances, colonial distillation would doubtless become a profitable trade:—

ARTICLE.	1860.	1861.	1862.	1863.	1864.	1865.	1866.
	£	£	£	£	£	£	£
Spirits, Brandy	258,235	250,816	248,966	438,041	289,874	210,639	217,971
,, Cordials	4,068	2,741	1,815	2,341	1,788	2,664	1,842
,, Gin	101,942	123,552	131,197	124,681	79,630	80,646	65,967
,, Rum	45,564	30,005	28,729	27,148	26,109	22,229	32,226
,, Whisky	46,910	21,616	43,472	47,969	33,642	9,587	28,202

The Jurors of Section 9b, Class III., beg leave to submit the following List of Awards:—

MEDALS.—VICTORIA.

339 Aitken, Thomas.—Whisky and Geneva.
259 Dickson, James.—Ginger Brandy.
260 Dixon, P. G.—Ginger Wine, Quinine Wine, Lemonade, Aërated Magnesia and Potash.
— Levy, John, and Sons.—Spirits of Wine.
293 Moody, Lesley A.—Spirits from William Piper's Wine, 53 o.p.; do. from Mr. Panton's, 10 u.p. Spirits; do. from Louis Kitz's Wine, 54 o.p.; do. from J. H. Dardel's Wine, 7 o.p., and J. H. Dardel's Wine, 10 u.p.; and Spirits from mixed Grapes, by L. A. Moody, 10 u.p.
299 Prevôt, E. and J., and Co.—Cloves and Peppermint.
302 Rowlands and Lewis.—Soda-water.

Sandhurst.

23 Bruce, William.—Lemon Syrup.

Beechworth.

57 Hattersley, John.—Soda-water.
66 Russom, E. S.—Lemonade.

Wangaratta.

31 M'Donald, W.—Brandy.

HONOURABLE MENTION.—VICTORIA.

253 Cohu, Andrew.—Ginger Brandy.
260 Dixon, P. G.—Sodawater and Peppermint.

265 Felton, Alfred.—Raspberry Vinegar and Quinine Wine.
269 Flintoff, Thomas, and Co.—Raspberry Vinegar, Brandy Bitters, Red Currant Wine, Raspberry Wine, Strawberry Wine, and Stomach Bitters.
275 Hemmons, F. and J.—Ginger Brandy, Peppermint, Bitters, Quinine Wine, and Maraschino.
280 Kingsland, G., and Co.—Gingerade and Maraschino.
293 Moody, Lesley A.—Spirits from William Piper's Wines, 42 o.p., 10 u.p., and 40 o.p.; from Mr. Panton's Wines, 15 u.p. and 10 u.p.; and Weber Brothers' Wines, 10 u.p.
294 Pearson, George.—Ginger Wine.
299 Prevôt, E. and J., and Co.—Lemon Syrup and Raspberry Balm.
312 Warrenheip Distillery Company.—Bottled Whisky, Bulk Whisky, Bottled Geneva, Bulk Geneva.

Sandhurst.

23 Bruce, William.—Ginger Wine and Bitters.

HONOURABLE MENTION.—NEW SOUTH WALES.

169 Lumsdaine, Henry.—Whisky from Barley, Malt, and Sorghum; Rum from Treacle and Sorghum; Spirits from Treacle and Sorghum.

MEDALS.—TASMANIA.

710 Grant, Mrs.—Raspberry Wine.
359 Lipscombe, Edward.—Gooseberry Wine.
367 Meredith, J.—Raspberry Vinegar.
342 Mezger, J.—Gooseberry Wine.
366 Paterson, John.—Cloves and Peppermint.
371 Russell, W.—Mead.
659 Weaver and Co.—Spirits of Wine.

HONOURABLE MENTION.—TASMANIA.

355 Brumby, Mrs.—Gooseberry Wine and Cherry Wine.
351 Hedger, George.—Gooseberry Wine.
359 Lipscombe, Edward.—Mulberry Wine, Elderberry Wine, and Red Currant Wine.
344 Moore, D.—Gooseberry Wine.
350 Tame, Joseph.—Gooseberry Wine.

MEDALS.—SOUTH AUSTRALIA.

65 Bickford, A. M., and Son.—Bitters.
44 Fisher, Daniel.—Brandy.
90 Nitschke, William.—Spirits of Wine.
63 Seppelt, J. E.—Assorted Liqueurs.

BOTTLED FRUITS, PRESERVES, PICKLES, SAUCES, VINEGAR, &c.

Class III.—Section 9 b.

J. BENN, ESQ., CHAIRMAN.

W. HOGARTH, ESQ. | J. WHITTINGHAM, ESQ.
GERMAIN NICHOLSON, ESQ. | J. COCKBURN, ESQ.

It is a pleasing duty of the Jurors to report that the large and excellent exhibition placed before them for inspection, and furnished from the various colonies, warrants them in giving it as their opinion that the

Australias are eminently adapted for the production and manufacture of articles embraced under this section.

As comparing them with English importations of the same class, both as for wholesomeness and quality, as well as for the style in which they are prepared for the market, they are generally equal and in some cases superior.

In pickles, sauces, jams, and bottled fruits, Victoria was well represented, and those from Tasmania were highly creditable.

The Victorian exhibits gained several medals. To Archibald Watt (313) we awarded the medal for Marmalade, Jellies, Jams, and Pickles, general excellence.

To G. W. Knight (202), the medal for Bottled Fruits and Jams, excellence of quality and preparation.

To Mrs. Shaw (304), the medal for Quince Jam, prepared from fruit grown by Sir Redmond Barry and colonial-refined sugar, excellence of make.

To Mrs. George Mitchell (291), the medal for Brandy and Pickled Fruits.

To Edward Zorn (317), the medal for Tomato Sauce and Preserved Cantaloupes. His other exhibits of various Sauces and Jams were entitled to honourable mention.

To E. H. Dunn (56), the medal for Ovens Sauce and Ketchup, superior quality. His exhibits of other Sauces and Jams were worthy of notice.

The award of honourable mention was gained by James Bryce (246), for Bottled Fruits.

By F. Fordham (270), for Sauces. He also exhibited Pickles.

By William Kirkbright (281), for Bottled Fruits.

By Charles Mapleston (285), for Jams, excellence of manufacture. He also exhibited Fruits preserved in sugar and vinegar, illustrative of the various uses to which Fruits may be applied.

By E. P. Peak, for Sauces and Ketchup.

The following exhibits were also worthy of mention :—

C. Clarson (251).—Jams.

S. Clarke and Co. (249).—Worcestershire Sauce.

In the Tasmanian Court the medal was awarded to Edward Lipscombe (369), for Jams, Jellies, and Marmalade.

To Mrs. Allport (391), for Jams and Marmalade, excellence of quality and make.

To Robert Stewart (430), for Orange Marmalade, excellence of make.

The award of honourable mention was given to J. Meredith (386), for Mushroom Ketchup.

To Mr. H. M. Hull (424), for Quince Preserves, claiming special notice for the low price they are produced at.

To C. F. Cresswell (455), for Quince Jelly, goodness of quality.

To Dickenson and Co. (403), for general exhibit of Jams and Marmalade.

Interesting exhibits were made by Dr. Husten (425), of Parsnip, Carrot, and Mangold Jams, which might become useful as a base in the manufacture of sauces.

The Hon. E. Abbott (459) exhibited Pickled Onions; and Mrs. Grant (706) an assortment of Pickles, Sauces, and Jams.

In the South Australian Court we awarded the medal to Mrs. L. A. Chame (26), for Tomato Sauce, excellence of quality.

To F. C. Davis (27), for Bottled Fruits and Olives, excellence of quality.

The exhibit by John Mordy (24) of Tomato Sauce was worthy of notice.

In the New South Wales Court the medal was gained by H. W. Macarthur (152), for Guava Jelly, Capers, and Cherry Brandy, general excellence.

By Mrs. Robertson (142) for Quince Jelly; and by Charles Moore (138) for Olives.

DRIED FRUITS, a new article in colonial exhibits, especially deserves prominent notice as being in itself one of great consumption, and which hitherto has formed one of the chief features in our imports. This industry, being a new one, was represented only to a small extent, but in sufficient quantity to convince the Jurors of the perfect adaptability of our colonies to produce an article equally well dried, and fresher—and therefore more valuable—than the imported article. The finest samples came from Western Australia.

In the Western Australian Court we awarded to Joseph Hardy (126) the medal for Raisins and Dried Apples, excellence of quality and condition.

To C. Ferguson (124) medal for Raisins, excellence of quality and condition.

In the South Australian Court the medal was gained by Thomas Hardy (28) for Muscatel Raisins and Soft-shell Almonds; the latter possessed great excellence.

In the New South Wales Court the medal was given to George Thomas Loader (151) for Dried Quinces; and to H. W. Macarthur (152) for Corinth Currants, excellence of quality.

In the Victorian Court the medal was given to Curtis A. Reid (64) for Sultana Almonds, quality excellent.

To James Chaffer (52) for Soft-shell Almonds. Samples of Raisins, Dried Apples, and Peaches were exhibited by him, but all out of condition.

To Humphrey Paley (60) for Dried Apples, Peaches, and Nectarines, all of good quality; and Raisins, well cured, and of good quality.

To Sydney Watson (67) for sample of Zante Currants, excellence of quality and condition. This exhibit was deserving of special remark.

To G. Spink (33), medal for Raisins, excellence of quality.

To James Cheeseley (54), honourable mention for preparation of Dried Peaches.

To Auguste Argnani (241), honourable mention for dried Figs and Apples.

In the Tasmanian Court the medal was awarded to W. S. Butten (388) for a bottle of Dried Plums for dessert, excellence of quality.

To J. Meredith (386), exhibit of Filberts and Walnuts.

To James Scott (416) for Hard-shell Almonds. His exhibit of Acorns was worthy of honourable mention.

VINEGAR.—With the exceptions mentioned in the awards, either from ignorance or the use of unfit material, the exhibits in this class were much inferior to that imported, and would not be accepted as a commercial article.

In the Victorian Court, Alfred Felton (265) gained the medal for the excellence of his Table Vinegar.

G. C. Heyneman (276), medal for Vinegar.

James Chaffer (52), the medal for White Wine Vinegar from colonial wine.

The samples from James Dickson (259) and Andrew Cohu (253) gained honourable mention.

A sample of strong Vinegar was exhibited by F. G. Docker (29). Those of Thomas Flintoff (269) were well got up and worthy of notice.

In the Tasmanian Court, Edward Lipscombe (369) gained the medal for Gooseberry Vinegar.

Mrs. Noakes (370) deserved honourable mention.

In the New South Wales Court, D. J. Monk (177) deserved honourable mention for Vinegar.

JOHN BENN, CHAIRMAN AND REPORTER.

The opening for colonial enterprise in the branches of trade above referred to is made manifest by the following table of imports, as furnished by the department of Customs :—

ARTICLE.	1860.	1861.	1862.	1863.	1864.	1865.	1866.
	£	£	£	£	£	£	£
Fruit (bottled).................	9,885	1,367	1,145	2,253	3,546	9,162	6,508
Vinegar	15,834	15,549	6,008	8,042	12,500	8,806	16,161
Preserves	28,163	28,226	16,795	37,349	46,999	33,476	27,898

The following is the List of Awards in this Section :—

MEDALS.—VICTORIA.

265 Felton, Alfred, 41 Swanston-street, Melbourne.—Table Vinegar and Currie Powder.
276 Heyneman, G. C., Melbourne.—Vinegar.
282 Knight, G. W., Rosenberg Vineyard, Riddell's Creek.—Bottled Fruits and Jams.
291 Mitchell, Mrs. George, Dorrit-street, Carlton.—Brandy and Pickled Fruits.
304 Shaw, Mrs., Carlton.—Quince Jam, from fruit grown by Sir Redmond Barry and colonial-refined sugar.
313 Watt, Archibald, 129 Queensberry-street, Hotham.—Jams, Jellies, Marmalade, and Pickles.
317 Zorn, Edward, Oakleigh.—Tomato Sauce and Preserved Cantaloupes.

HONOURABLE MENTION.—VICTORIA.

241 Argnani, Auguste, Dunolly.—Dried Figs and Dried Apples.
246 Bryce, James, 240 Victoria-parade, East Melbourne.—Bottled Fruits.
253 Cohu, Andrew, 24 Little Collins-street, Melbourne.—Malt Vinegar.
259 Dickson, James, 9 Latrobe-street, East Melbourne.—Vinegar.
270 Fordham, F., 1 William-street, Melbourne.—Sauces.
281 Kirkbright, W., Collingwood.—Bottled Fruits.
285 Maplestone, Charles, Ivanhoe Lodge, Heidelberg.—Jams.

MEDALS.—OVENS DISTRICT.

52 Chaffer, James, Indigo Creek, Barnawartha.—Soft-shell Almonds and White Wine Vinegar, from colonial wine.
56 Dunn, E. H., Beechworth.—Ovens Sauce and Ketchup.
60 Pooley, Humphrey, Indigo Creek, Barnawartha.—Dried Apples, Peaches, Nectarines, and Raisins.
64 Reid, Curtis A., Reidesdale, Ovens.—Sultana Almonds.
67 Watson, Sydney, Walwa, Upper Murray.—Zante Currants.

HONOURABLE MENTION.—OVENS DISTRICT.

54 Cheeseley, James, Indigo Creek, Barnawartha.—For Preparation of Dried Peaches.
58 Peak, E. P., Chiltern.—Sauces and Ketchup.

MEDAL.—WANGARATTA DIVISION.

33 Spink, G., Tarrawingee.—Raisins.

MEDALS.—NEW SOUTH WALES.

151 Loder, George Thomas, Singleton.—Dried Quinces.
152 Macarthur, Hon J. and Sir W., Camden Park.—Corinth Currants, Guava Jelly, Capers, and Cherry Brandy.
138 Moore, Charles, Botanic Gardens, Sydney.—Olives.
142 Robertson, Mrs., Grafton, Clarence River.—Quince Jelly.

HONOURABLE MENTION.—NEW SOUTH WALES.

177 Monk, D. J., Wattle-street, Sydney.—Vinegar.

MEDALS.—TASMANIA.

391 Allport, Mrs., Hobart Town.—Jams and Marmalade.
388 Button, W. S., Launceston.—Dried Dessert Plums.
369 Lipscombe, Edward, Sandy Bay, Hobart Town.—Jams, Jellies, Marmalade, and Gooseberry Vinegar.
430 Stewart, Robert, Launceston.—Orange Marmalade.

HONOURABLE MENTION.—TASMANIA.

455 Cresswell, C. F., Murray-street, Hobart Town.—Quince Jelly.
403 Dickenson and Co., Hobart Town.—Jams.
424 Hull, Mrs. H. M., Hobart Town.—Quince Preserves.
386 Meredith, J., Cambria.—Mushroom Ketchup, Filberts, and Walnuts.
370 Noakes, Mrs., Longford.—Malt Vinegar.
461 Scott, James, Launceston.—Hard-shell Almonds and Acorns.

MEDALS.—SOUTH AUSTRALIA.

26 Chance, Mrs. L. A., Parkside, Adelaide.—Tomato Sauce.
27 Davis, F. C., Fulham, Adelaide.—Bottled Fruits and Olives.
28 Hardy, Thomas, Bankside, Adelaide.—Muscatel Raisins, and Softshell Almonds.

MEDALS.—WESTERN AUSTRALIA.

124 Ferguson, C., Swan.—Raisins.
126 Hardey, Joseph, Peninsula.—Raisins, Dried Peaches, Apricots, and Apples.

PYROLIGNEOUS ACID, POTASH, SODA, ESSENTIAL AND PREPARED OILS AND THEIR CAKES, PERFUMERY, MODELS OF FRUIT AND VEGETABLES.

Class III.—Section 9 c.

W. HERBERT GOSSAGE, F.C.S., CHAIRMAN.

REV. J. J. BLEASDALE, D.D. | G. WRAGGE, ESQ.
W. JOHNSON, ESQ., GOVERNMENT ANALYTICAL CHEMIST.

As these sections may be looked upon as a subdivision of Class I., Section 2 (Chemical and Metallurgical Products and Processes), the jury deem it unnecessary to enter into introductory remarks on the art and science of chemistry, which have been already made by the jury of Section 2; they proceed, therefore, to the immediate consideration of the various products and processes to which their attention has been directed.

Pyroligneous Acid—the first on our list—is, as its name implies, obtained by the destructive distillation of wood. The process is conducted on a large scale in cast or wrought iron retorts, heated directly by fire or by super-heated steam, and the products of the destructive distillation are naphtha, tar, and pyroligneous acid; charcoal being left in the retort. The pyroligneous acid, the product of this method, is neutralized by lime, and the solution boiled to dryness is called lime salt, and in this form becomes an article of commerce. This lime salt is used for the several manufactures of acetic acid, sugar of lead, and acetate of soda. The quantity of pyroligneous acid and quality of charcoal obtained vary with the kind of wood used; on this subject some very valuable facts, collected and tabulated by Stolze, in his work on pyroligneous acid, are to the following effect:—

One Pound of Wood.	Weight of Acid.	Carb. Potass Neutralised by One Ounce of Acid.	Weight of Charcoal.
	Ozs.	Grs.	Ozs.
White Birch—Betulla alba	$7\frac{1}{2}$	55	$3\frac{7}{8}$
Red Birch—Fagus sylvatica	7	54	$3\frac{7}{8}$
Large-leaved Linden—Tilia pataphylla	$6\frac{7}{8}$	52	$3\frac{5}{8}$
Oak—Quercus robor	$6\frac{7}{8}$	50	$4\frac{1}{8}$
Ash—Fraxinus excelsior	$7\frac{1}{4}$	44	$3\frac{3}{4}$
Horse Chesnut—Esculus hippocastanus	$7\frac{3}{8}$	41	$3\frac{5}{8}$
Lombardy Poplar—Populus dilatata	$7\frac{5}{8}$	40	$3\frac{3}{4}$
White Poplar—Populus alba	$7\frac{5}{8}$	39	$3\frac{3}{4}$
Bird Cherry—Prunus padus	7	37	$3\frac{1}{8}$
Basket Willow—Salix	$7\frac{3}{8}$	35	$3\frac{1}{2}$
Buckthorn—Rhamnus	$7\frac{1}{8}$	34	$3\frac{1}{2}$
Logwood—Hematoxylon campechianum	$7\frac{1}{8}$	35	2
Alder—Alnus	$7\frac{3}{8}$	30	$3\frac{1}{4}$
Juniper—Juniperis communis	$7\frac{1}{4}$	29	$3\frac{3}{8}$
White Fir—Pinus abies	$6\frac{3}{8}$	29	$3\frac{3}{8}$
Common Pine—Pinns sylvestris	$6\frac{3}{4}$	28	$3\frac{1}{4}$
Common Savine—Juniperus sabina	7	27	$3\frac{3}{8}$
Red Fir—Abies pectinata	$6\frac{3}{8}$	25	$3\frac{1}{4}$

From the above table it will be seen that the products vary very much according to the wood used. As illustrating this subject, Dr. Mueller—to whose investigations the colony is already deeply indebted, and whose report will be found in this collection—exhibits a number of wood

vinegars and acetates obtained from the several varieties of eucalypti. Mr. Hugh Gray, also of Ballarat, who exhibited in the Victorian Exhibition of 1861, and who paid considerable attention to the destructive distillation of white gum, has worked in this field, and has reported that he obtained from 100 ozs. of partially-dried timber as the first distillate the following products:—

	ozs.
Charcoal of superior quality	24
Pyroligneous acid	54
Tar	7
Gaseous matter	15
	100 ozs.

He reports the second distillation of the 54 ozs. of crude pyroligneous acid to have given:—

	ozs.
Pyroxlic spirit	½
Pyroligneous acid	50
Tar	3½
	54 ozs.

Comparing these figures with those of Stolze, it becomes apparent that the wood of this colony is quite as good for the manufacture of charcoal and pyroligneous acid as any of the European woods; and we opine that, when sufficient demand for the manufactured article shall have sprung up, the eucalypti especially will be found in every sense available for the purpose.

POTASH.—This substance is so called from its being prepared on the large scale by evaporating in iron pots the lixivium of the ashes of wood fuel. In its crude state it consists of such constituents of burnt vegetables as are very soluble in water, and fixed in the fire. As a result of the combustion of these woods, the potash salts of plants originally containing vegetable acids are converted into carbonates; the sulphates into sulphites, sulphides, or even into carbonates, according to the manner of incineration; the nitrates also change into carbonates, but the chlorides remain for the most part unaltered. In Canada, where timber must be cleared before the land can be cultivated, the wood is cut down, piled in great heaps, and burned solely for the manufacture of potash; the ashes are then put into large vessels, and lixiviated with water, to which a little lime has been previously added. The clear liquor is now evaporated to dryness, and fused at a red heat into compact masses, which are grey on the outside and pink within. The best pink Canadian potashes, as exported in casks containing about 5 cwt., average generally 60 per cent. of absolute potash, while the best pearlashes contain on an average 50 per cent. The alkali in the former is in a caustic state; in the latter it is carbonated.

Considering the economic question of the extraction of alkali from the vegetable kingdom, in its most general sense, it may be remarked that all kinds of vegetables do not yield the same proportion of alkali. The more succulent the plant, the more alkali does it commonly yield; for it is only in the juices that these vegetable salts (which are converted by burning into alkaline matter) reside. Certain herbaceous weeds are, from this cause, more productive of potash than the graminiferous species or than shrubs, and these in their turn than trees; and for a like reason twigs and leaves are more productive than timber. The soil in which they grow also

influences in each of these the quantity of their saline matter. The elm and maple are stated as the best American woods, and are said to yield 3·9 of pure potash from 1000 of wood.

In the present Exhibition three samples of potash, made according to Sir W. Denison's instructions, are shown by Mr. James Bulman, Ringarooma, Tasmania. These samples have been analyzed, and found to contain as follows of alkali, computed as potash :—

Bark of white gum...	18·3 per cent.
Wood of white gum	20·8 ,,
Common fern and wood and bark of white gum ...	28·6 ,,

As no information is given as to the quantity of these very crude potashes obtained from a given weight of raw material, no estimate can be formed of the commercial value of the facts thus set forth.

Potash, although much less accessible than soda, is in its combined state both widely diffused and tolerably abundant in nature. Sea-water contains about 0·257 parts of potassium in a thousand parts, the metal existing in combination as chloride and sulphate; and granite, as well as other rocks into which potash-felspar enters as a constituent, contain potash in the proportion of from 12 to 16 per cent. of the weight of the felspar. Nice distinctions of properties adapt potash for many purposes for which the more readily accessible soda is not equally available, and this is so far the case that an abundant supply of this scarcer alkali has been considered as a matter of national importance. Thus it is found that nitrate of potash is suitable for the manufacture of gunpowder, for which nitrate of soda is quite inapplicable, and for this one employment as munition of war it becomes imperative that each national power should possess its own internal supply. The extraction of potash from granite, and other felspathic rocks, although demonstrable, can be hardly considered at this date as a method available for actual economic pursuit; but there is no doubt that the proposed methods are so closely allied to actual practice that, in case of a diminution of supply from other sources, they would at once come into extensive and profitable employment.

The extraction of potash salts from sea-water is a method in actual operation in the south of France; and recently the formations above the rock-salt deposits, as they exist at Stassfurth, near Magdeburgh, and as they will probably be found to exist above similar deposits in other localities, promise to yield a supply of potash salts sufficiently abundant for the purposes of agriculture, as well as for those of war.

But the selective powers of the organic kingdoms afford the readiest means of obtaining this alkali. Maumené and Rogelet recover potash from the yolk of wool on a manufacturing scale, every thousand pounds of wool in the grease yielding from 70 to 90 lbs. of pure carbonate of potash, besides 5 or 6 lbs. of sulphate and chloride of the same base. Regarding these methods of extraction of potash from sea-water and wool as remunerative, still the readiest of all sources of supply is, admittedly, that afforded by the vegetable kingdom. The plant selects potash salts from the soil, treasuring them up in its tissues, so that whenever timber or other suitable vegetable is abundant, we may obtain this alkali, in a more or less pure state, by the method previously described.

Essential Oils.—The location of the oil in the plant is a matter of importance to the manufacturer, and it has been found that the volatile

oils occur in every part of certain plants, while in others they are contained only in the blossoms, in the seeds, the root, or the bark. It sometimes happens that different parts of the same plant contain different oils, one of which may reside in the flowers, another in the leaves, and even another in the skin of the fruit.

Volatile oils are usually obtained by distillation. The plant is put into a still, water poured upon it, and heat applied; the volatile oil comes over with the aqueous vapour at 212° Fahr. If no water were present the temperature required would be much higher, and would probably destroy the purity of the oil. In the preparation of essential oils from Victorian plants, Mr. Bosisto passes steam directly into his stills and among the leaves, &c.

Essential oils differ much from each other in their physical properties. Most of them are yellow, others are colourless, red, or brown; some again are green, and a few are blue. They have a powerful smell, more or less agreeable, which immediately after their distillation is a little rank, but becomes less so by keeping. The odour is seldom so pleasant as that of the recent plant. Their taste is acid, irritating, or heating, or merely aromatic, when they are largely diluted with water or other substances. They are not greasy to the touch, like the fat oils, but on the contrary make the skin feel rough. They are almost all lighter than water, only a very few falling to the bottom of this liquid; their specific gravity lies between 0·847 and 1·096, the first number denoting the density of oil of citron, and the second that of oil of sassafras. Although styled "volatile oils," the tension of their vapour, as well as its specific heat, is much less than that of water. The boiling point differs in different kinds, but it is usually about 316° or 320° Fahr.

The exhibits under this head are very numerous, the exhibitors being Mr. P. Boardman, of Nunawading; Mr. J. Bosisto, of Richmond; and Mr. W. H. Slater, Nunawading. The jurors have considered each of these gentlemen to be deserving of a medal. Mr. Bosisto's samples were remarkably clean and distinct. The others appear to have been made all in the same still, a circumstance which has slightly affected their purity and individual character. Messrs. Morgan, Melbourne and Co., of Batavia, exhibit some very fine samples of essential and expressed oils, for which a medal has been granted. Honourable mention is also made of the essential oils exhibited by Dr. Huston and Messrs. Weaver and Co., of Tasmania.

Since the Victorian Exhibition of 1861, the essential oils from the eucalypti and other vegetation have so far advanced into notice as to become articles of export. The very elaborate account furnished by Mr. Bosisto to the Jurors of the Exhibition of that year, together with their further investigations, supersede inquiry by the present Jurors on this subject. The oils now shown by an increased number of exhibitors are in most cases repetitions of those of 1861; but there are also, besides these, some new kinds. These exhibits, which, collectively, form a very interesting and important aggregate of the products of our native vegetation, show that this enterprize, when pushed as a manufacture, will doubtless lead to a large and lucrative trade.

It is not always an easy task to adjudicate with justice concerning claims to priority. It may, however, be stated in reference to these essential oils, that it was Dr. Mueller who first directed the efforts of Mr. Bosisto, by pointing out the probability of the myrtaceous

vegetation of the country affording valuable volatile oils; and that the exhaustive investigations of the latter gentleman have been further assisted and fortified by information from the source indicated.

The prospects of the trade are implied in the fact that the indigenous vegetation of Australia belongs in large proportion to the myrtaceous family, of which the genera Eucalyptus and Melaleuca may be taken as representatives. The oils from the numerous species of these have a strong resemblance to each other, varying in minor characters. For these distinctions a division into types has been adopted, and we are informed those selected for this Exhibition, in Mr. Bosisto's case, represent most completely this mode of grouping, so that each oil stands there as the representative of a number of oil-producing species, each section having an aroma, and other characteristic properties, in common. The oils from the above-named genera are all, with one exception, of various shades of straw colour; this colouring principle takes its rise from an oleo-resin (the product of oxidation) held in solution, and it is remarked that the less of this oxydized resinous constituent, and the less consequent colour, the nearer does the sample of oil approach to its original highly-aromatic character.

Among other samples there is in Mr. Bosisto's case a beautiful green oil *(Eucalyptus Stuartiana)*; this green tint is attributable to the chlorophyll of the plant. There is also an oil *(Eucalyptus persicifolia)* possessing a fine aroma, which closely resembles that of lemon grass; and we observe an exhibit of the leaves of this species in the New South Wales Court. These oils have been found useful, both in England and Australia, in the manufacture of perfumery, and especially for scenting soaps. They form good *basic* odours, and it is important to remark that these can be materially altered, on account of the readiness with which they yield up their own identity on the addition of essential oils in consonance with them. The solvent power of these oils is also great, varying somewhat in the different types; that of the "*Globulus*, or Blue Gum type" being superior to that of all other oils hitherto discovered. In this class we notice the following species:—*Globulus* or Blue Gum, *Goniocalyx* or White Gum, *Sideroxylon* or Iron Bark, *Oleosa* and *Dumosa* Scrub Gums. As medicines, these oils may be classified as stimulants, carminatives, and anti-spasmodics. They are also valuable rubefacients. To whatever extent of demand these interesting compounds may ultimately attain in their application to the arts, the bye products available after distillation should not be lost sight of. The latter, judging from their characters, appear to promise a subsidiary profit to the manufacturer by their application to other useful purposes.

Essential oils obtained from imported oil-producing plants have received some attention from Mr. Slater, of Nunawading, and also from Mr. Boardman. There can be no doubt that the soil and climate of Victoria are particularly favourable to the growth of these oil-producing plants. Fields of true peppermint, lavender, rose, rosemary, and geranium will, in all probability, before long prove highly remunerative to the cultivator.

Perfumery, using the term in its daily acceptation, may be distinguished from fragrant essential oils and other sweet-smelling definite compounds; the latter are the materials of the perfumer, while items of perfumery are the products of his art. Attar of roses, or any other essential oil, may be bought or sold, and, in fact, generally estimated according to its well-

recognised definite properties; but perfumery, whether spirituous solutions, fragrant soaps or washes, powders, salves, or cosmetics, are recognised and accepted in commerce according to an arbitrary standard of pleasantness or adequacy in use—of fashion, judgment, opinion, or caprice of the consumer. The art of perfumery, as existing at the present day, is largely indebted to chemistry, although soap (a later manufacture than that of perfumes) has become a serious rival to the trade of the perfumer. Cleanliness of the person, linen, and habitations of the people of to-day render unnecessary to a great extent the use of perfumes, which were formerly resorted to in order to conceal the absence of these essentials to the comforts of daily life; and thus we still find that those persons whose habits are the opposite of cleanly are also notoriously great consumers of perfumery.

Some of the most delicate perfumes are now made by chemical artifice, and not as of old by distilling them from flowers. Curiously enough, they are principally derived from substances of intensely disgusting odour. "Fusel oil," a peculiar fetid oil, most irritating and offensive in its crude state, is the basis of most of the essences used in confectionery. Thus, oil of apples is made by distilling fusel oil with sulphuric acid and bichromate of potash, while the same rank oil distilled with sulphuric acid and acetate of potash gives the oil of pears. The oil of pineapples is obtained from a product of the action of putrid cheese on sugar, or by making a soap with butter and distilling with alcohol and sulphuric acid, and is now largely used in England in the preparation of *pineapple ale*. Oil of grapes and oil of cognac, used to give the flavour of French cognac to the crude spirit made from beet-root and other sources, are little else than fusel oil. So also oil of bitter almonds, so largely used in confectionery and for perfuming soap, is made by the action of nitric acid on the fetid oils of gas tar. As Dr. Lyon Playfair says—"Many a fair forehead is damped with eau de millefleurs, without knowing that its essential ingredient is derived from the drainage of cow-houses." All these are direct modern appliances of science to an industrial purpose, and imply an acquaintance with the highest investigations of organic chemistry. Let us recollect that the oil of lemons, turpentine, oil of juniper, oil of roses, oil of copaiba, oil of rosemary, and many other oils, are identical in composition, and we shall find it not difficult to conceive that perfumery may derive still further aid from chemistry.

The samples of perfumery shown by Mr. Slater, of Nunawading, were considered very fine, particularly his otto. Mr. H. Watts also had some beautiful perfumes distilled from flowers grown in Warrnambool. Mr. E. H. O'Neil, of Sydney, New South Wales, also exhibited some very fine perfumes, very tastefully arranged, and which he had manufactured from flowers indigenous to New South Wales; some of these were peculiarly sweet. Medals were awarded to each of these gentlemen, and honourable mention was made of Mr. R. Appleton's Exhibition Bouquet.

Models of fruit in wax and other materials have been included in this section, and are therefore duly considered in our list of awards. These objects are obviously of a character embodying some degree of artistic as well as constructive ability. Admitting the difficulty pertaining to decisions on objects of this mixed character, we trust that our awards will have covered the general question of merit.

W. H. GOSSAGE, F.C.S., Reporter.

The following is a List of the Awards in this Section :—

MEDALS.—VICTORIA.

243 Boardman, P., Nunawading.—Essential Oils.
244 Bosisto, Joseph, Richmond.—Distillations from Native Vegetation.
192 Mueller, Dr., Melbourne.—Chemical Products.
305 Slater, W. H., Nunawading.—Essential and Prepared Oils.
255 Thomas, Miss.—For Fruit Models.
314 Watts, Henry, Warrnambool.—Perfumes Distilled from Native Flowers.

HONOURABLE MENTION.—VICTORIA.

240 Appleton, Robert, Melbourne.—For general Perfumery, particularly Exhibition Bouquet.
29 Docker, F. G., Wangaratta.—Samples of Olive Oil, goodness of flavour. The other samples of Olive Oil were spoiled from exposure to light and heat.

MEDALS.—NEW SOUTH WALES.

287 Barnes, Henry.—Models of Fruit in Wax.
178 O'Neil, E. H., Sydney.—Perfumes from Indigenous Plants.

MEDAL.—NETHERLANDS-INDIA.

— Morgan, Melbourne and Co., Batavia.—For Fine Essential and Expressed Oils.

MEDAL.—SOUTH AUSTRALIA.

73 General Committee.—Fruit Models.

MEDAL.—TASMANIA.

328-331 Jhonson, Mrs., Hobart Town.—For Fruit Models in Wax.

HONOURABLE MENTION.—TASMANIA.

82 Huston, Dr., New Norfolk.—Oil from Blue Gum Leaves.
83-87 Weaver and Co., Hobart Town.—For Essential Oils from Eucalyptus.
652 Weaver and Co., Hobart Town.—For Acidulated Syrup.

MEDAL.—NEW CALEDONIA.

28 Bavay, Mons., Chemist, Imperial Navy, Noumea.—Essential Oils.

HONOURABLE MENTION.—NEW CALEDONIA.

30 Gerben, Mons., Noumea.—Samples of Cacholot Oil.
32 Pancher, Mons., Noumea.—Oil of Aleurites.

POTTERY AND GLASS.

Class IV.—Section 11.

A. K. SMITH, ESQ., C.E., F.R.S.S.A., CHAIRMAN.
R. ADAMS, ESQ., C.E. | H. W. STEWART, ESQ.
W. C. KERNOT, ESQ., M.A., C.E.

The articles comprised in this section are all of an useful description, and although some of the exhibits possess considerable artistic merit, yet the jurors have been guided in making their awards more by the quality and strength of the material used and its application to the manufacture of

articles of domestic use, than by the ornamental design of the articles themselves.

In the article of brown potteryware, for ordinary domestic and dairy purposes, the demand, both in this and the neighbouring colonies, is far in excess of the supply. Wine and spirit merchants will also require large quantities of this description of pottery (brown jars), as they prefer, especially in this climate, earthenware to wood kegs, of which a very large number is used by them.

From the general excellence of the articles exibited the Jurors are of opinion that this useful branch of industry is now in a fair way of being fully developed, and of absorbing a considerable amount both of juvenile and adult labour.

The discovery of suitable clays in large quantities and of excellent quality throughout the whole of the colonies will do much to stimulate this industry, and it affords the Jurors in this section much pleasure to note the successful introduction in this and the neighbouring colonies of such an important branch of manufacture.

Such satisfactory progress has been made, and so much proficiency has been attained, as to enable the Jury, after careful examination, to state that many of the articles exhibited cannot be surpassed by any of British manufacture.

MEDAL.

56 Stieling, G. P., Richmond.—Watercoolers, Jugs, &c., of porous clay.

The Jurors beg to call attention to the shape and configuration of the above articles, which are of a superior description, and reflect credit on the taste and skill of the manufacturer. They have pleasure in awarding a medal to Mr. Stieling for general excellence in workmanship, form, and decoration, but take exception to the use of paint on porous articles.

HONOURABLE MENTION.

87 Marks, J. G., Ballarat.—Samples of Pottery, Watercoolers, Flowerpots, &c.

The watercoolers and pots are good in form.

MEDAL.

332 Chesterfield Pottery Company, Melbourne.—Jars, Pans, and Bottles.

An excellent exhibit of articles for domestic use and dairy purposes.

HONOURABLE MENTION.

333 Cornwell, Alfred, Brunswick.—Assorted Stoneware.

A small but good exhibit.

HONOURABLE MENTION.

342 Hirschi, G., Castlemaine.—Watercoolers, Electric Battery Cells, Insulators, &c.

MEDAL.

36 Guthrie, G. D., Epsom (Sandhurst Division).—Stoneware, Jars, Gingerbeer Bottles, &c.

This exhibit comprises a fine collection of useful articles, made of excellent materials, and well burnt and vitrified.

The Jurors broke some of the ginger-beer bottles, and found them well finished and glazed inside.

They beg to call the maker's attention to the covers of some of the jars and filters, which have been carelessly or hurriedly fitted. As evidence abounds to show there has been no lack of skill on the part of the potter, this imperfection is therefore the less excusable.

MEDAL.

180a Brown, James A., Sydney.—Glass Carboys and Sodawater Bottles, &c.

This is an important exhibit, not so much from the number of articles exhibited, or for their superior quality, but because their manufacture has hitherto been a great desideratum in the Australian colonies.

The Jurors award a medal to Mr. Brown for the samples of glass carboys and bottles. The jurors were informed that some of the latter have been proved to a pressure of over two hundred pounds per square inch, thus showing great strength, an element essentially necessary to guard against accident when used for effervescent drinks.

MEDAL.

181 Field, Thomas, Sydney.—Filters, Watercoolers, Insulators, Jars, &c.

The Jurors awarded a medal for general excellence in manufacture and form.

MEDAL.

185 Welham, Nathan, Newcastle, New South Wales.—An assortment of Pottery-ware, Gingerbeer Bottles, &c.

The Jurors awarded a medal to this exhibit. The ware was well made, burned, and glazed, and the bottles when broken showed they had been carefully made, and ranked in quality next to those made by Guthrie, of Epsom.

The Jurors would beg to remark upon the article of flowerpots, that, though excellently made, the various samples seem to be deficient in porosity, and would call the attention of the makers to this great defect, and feel satisfied that the manufacturers will best consult their own interests by making an article properly adapted for its intended purpose.

In the article of gingerbeer bottles, for which there is a large demand, the Jurors are of opinion that, with proper care and attention, a very superior article can be made at a price to compete successfully with those imported, and the excellency of the samples shown by Guthrie, Field, and Welham (price 20s. and 18s. per gross) is in every respect equal to that of those imported.

The sample of native pottery, exhibited by the Colonial Secretary of New Caledonia, deserves attention as being made entirely by hand, and without the aid of the potter's wheel, or any other machinery, and still sufficiently perfect to answer its intended purpose, both as a jar to contain liquid and as a cooking utensil.

In conclusion, the Jurors beg to add that they have much pleasure in

being allowed to reward exhibitors in this class for their successful introduction into the Australian colonies of the important manufactures of those useful articles that have hitherto been imported from distant lands.

ALEX. K. SMITH, REPORTER.

APPENDIX.

NOTE A.—Copy of telegram relating to exhibits by Guthrie and Co.:—

Sandhurst, 10th January, 1867.

Price of gingerbeer bottles, 20s. gross.—J. HOLDSWORTH.

NOTE B.—Copy of letter from W. G. Henfrey, being certificate relating to exhibits by J. A. Brown, Sydney:—

119 Castlereagh-street, Sydney, 7th January, 1867.

Mr. Brown.—Dear Sir—I received your note accompanying the sodawater bottles. I have, as you requested, had them filled with soda and tonic waters. I had my best engine put up to the highest possible pressure that the gauges would allow, which is *200 lbs. to the inch, or about *20 atmospheres. They (the bottles) are made as evenly all through as any of the best English ones I have ever seen. I have had 30 years' practical experience in the manufacture of aërated waters, and therefore think I am competent to give an opinion. I may add, that the engine I used to fill them with was one of Hayward Tyler's, and was sent direct to me from the Great Exhibition of 1851.

I need scarcely tell you I shall be most happy to purchase all I use from you for the future, and that is about 500 gross per year. Wishing you every success, I remain yours truly, (Signed) W. G. HENFREY.

A true copy.—A. G. DE GYULAY, Secretary to the New South Wales Exhibition Commission for Melbourne and Paris.

NOTE C.—Copy of letter referring to exhibits by Thomas Field:—

City Pottery, George-street, Sydney, 11th January, 1867.

Sir—In reply to telegram, price of gingerbeer bottles 18s. (eighteen shillings) per gross, delivered on board (crates extra). Filter, with best tap, similar to the one now at the Exhibition, 24s. (one pound four shillings). Drain-pipes: 3-inch, 5d. per foot run; 4-inch, 6d. ditto; 6-inch, 9d. ditto; 9-inch, 1s. 6d. ditto; 12-inch, 2s. 6d. ditto; 16-inch, 5s. 6d. ditto; 18-inch, 7s. 6d. ditto. The waterbottles sent were made by me from Sydney clay. Price bottle and stand, 2s.—I am, Sir, your obedient servant, (Signed) THOS. FIELD.

Joseph Dyer, Esq., Melbourne Exchange, Melbourne.

The Customs returns indicate the importance of fostering colonial productions in the above section of trade, as will be seen by the amounts paid annually for imported goods:—

ARTICLE.	1860.	1861.	1862.	1863.	1864.	1865.	1866.
	£	£	£	£	£	£	£
Earthenware	60,110	40,778	58,400	70,180	61,859	43,591	28,853
Glass Bottles	12,249	8,801	4,441	4,651	5,537	3,738	2,332

* The two statements here do not agree. If the pressure were 200 on the circular inch they would assimilate more nearly, but would still be incorrect, thereby lessening the value of this certificate.—A. K. SMITH.

The following is the List of Awards in this Section :—

MEDALS.

Locality.	Catalogue.		Name of Exhibitor.	Objects Rewarded.
	Page.	No.		
Richmond ...	13	55	Stieling, G. P.	Watercoolers, and Jugs of Porous Clay.
Melbourne ...	23	332	Chesterfield Pottery Company	Brown Pottery Jars, Pans, and Bottles.
Epsom	48	36	Guthrie, G. D.	Stoneware Jars, Jam Pots, Gingerbeer Bottles, &c.
Sydney	65	181a	Brown, James A.	Glass Carboys, Sodawater Bottles, &c.
Do.	...	181	Field, Thomas	Pottery (General).
Newcastle ...	...	185	Welham, Nathan	Potteryware, Assorted.

HONOURABLE MENTION.

Ballarat	14	87	Marks, J. G.	Watercoolers, Flowerpots, &c.
Brunswick ...	23	333	Cornwell, Alfred	Assorted Stoneware.
Castlemaine.	...	342	Hirschi, G.	Watercooler, Electric Battery Cells, Telegraph Insulators, Gold Refining Cup and Cover.

IRON, HARDWARE, BRUSHWARE, &c., AND CUTLERY.

Class IV.—Section 11 a.

ALEXANDER KENNEDY SMITH, ESQ., C.E., F.R.S.S.A., CHAIRMAN.

R. ADAMS, ESQ., C.E. | J. HOLMES, ESQ., SANDHURST.
D. M. GALLAGHER, ESQ. | HON. C. J. JENNER.
W. KERR THOMPSON, ESQ. (M'EWAN AND CO.)
JOHN WHITEMAN, ESQ., M.L.A. (ASSOCIATE).

The exhibits in this section (as might be expected in a young colony) are not so varied in kind as would be found in similar exhibitions in older countries, where manufactories of this class of goods have been long established, and where scarcely a year passes without some new branch of such industries being added to the already widely-extended list.

It is gratifying to find, however, that the necessity for providing new fields of industry has stimulated us to establish many useful manufactories.

Amongst the most important in this section are those of rolled and hammered iron, sheet lead and lead piping, ovens, ranges, tinware, &c., each of which has had a most beneficial effect in reducing the price of such goods to the consumer, creating a field in the colony for the investment of capital, and giving employment to large numbers of a rapidly-increasing population.

The Jury also note with pleasure that, while entering into successful competition with importers, our manufacturers have, in many instances, by a judicious division of labour, been able not only to reduce their prices to a

minimum, but have gradually so improved the quality of their wares as to leave little or nothing to be desired.

It has been considered that short descriptions of the articles exhibited in this section would add to the value and public utility of the report, and that references to the use, novelty, superiority of design and execution, increased efficiency or economy, with reliable information respecting the date when certain manufactories were established, and the effect they have had upon the price of imported goods of a similar description in our own markets, would also be of interest.

First, then, as the most important article in this section, the Jury would instance the manufacture of rolled and hammered bar iron from malleable scrap.

ROLLED IRON.

This important branch of industry has been specially adopted by the exhibitor, Mr. Robert Amos, and, as the only one in the colony, deserves more than passing notice, especially when it is considered how far we are from the other sources that supply our present market, and the time required before any special order can be executed and delivered in this colony.

The rolling mill for the manufacture of rod and bar iron from malleable scrap was established in 1860. It now comprises—a forge, merchant and guide rolls, and consists of one of Condie's patent 40 cwt. steam hammers, weighing about 30 tons; a set of forge rolls, with bed plate and housings, weighing about 35 tons; one 11-inch merchant, with finishing rolls complete; one 6-inch guide-roll, for making the various sizes and kinds of iron now exhibited; shears, circular saw for hot iron, punching and shearing machine, &c., the whole driven by a 40-horse power high-pressure horizontal steam engine, supplied by two Cornish boilers, the steam in which is generated by the waste heat from two reverberatory furnaces. There are also a lathe for turning rolls, straightening plate, cooling gridiron, &c., &c. The specimens exhibited show the sizes and shapes hitherto rolled, and comprise:—Round and square iron, from $\frac{3}{8}$ in. to 2 inches; flat iron, from $\frac{3}{4}$ in. x $\frac{1}{8}$ in. up to $3\frac{1}{2}$ in. x 1 in.; angle iron, from 1 in. up to $2\frac{1}{4}$ in.; half-round and feather-edged iron; mining and other rails, from 10 lbs. to 28 lbs. per lineal yard; sash bars, fluted bars for fencing, fire bars, fish plates, patent tyre iron, &c., &c. Any other size or shape of iron can be rolled, so long as the weight does not exceed 30 lbs. per yard.

The quantity hitherto made has averaged about 60 tons per month, the value of which may be estimated at £9000 per annum, and wholly made from scrap-iron procured in this and the neighbouring colonies, the collection of which gives a considerable amount of employment.

With the present appliances 100 tons per month can easily be made.

The cost of production, when the work was originally started, was about £12 10s. per ton, but by alterations, improvements, and additions, the cost is now reduced to about £9 10s. per ton, made up of the following items:—

Scrap iron	£3	5	0
Labour	3	15	0
Coals	2	0	0
Wear, tear, and other contingencies	0	10	0
	£9	10	0

That there is an ample market to keep this manufacture in full work may be imagined from the fact that the quantity of rod and bar iron cleared out for Victoria is about 7000 tons per annum. This quantity is chiefly imported by the leading ironmongery establishments, although occasional shipments (made, apparently, for financial purposes) come to hand consigned to firms outside the trade, and are sold at low rates.

This manufactory has been a great boon to engineering and other trades using iron, by acting not only as a check upon the price of imported iron, but more particularly in supplying certain sizes of which there may be only a small quantity in the market when required for some special purpose. The writer of this at one time had 240 tons made to order, after purchasing all of the size required in the Melbourne, Sydney, and Adelaide markets.

To this exhibit the Jury awarded a medal.

HAMMERED IRON.

The best exhibit of hammered iron was from Mr. Wm. Williams, Yarra Bank Works (page 31, No. 559)—massive hammered shafting, wrought forgings, and uses. This is also an important manufacture, and by its aid we are enabled to execute repairs to ocean steamers and other heavy engines or works at a short notice, for which, previous to its introduction, special sizes had to be ordered and kept on hand (sometimes for many years) to meet such contingencies, at a great loss to the importer, or, if sold, at a most exorbitant price to the purchaser.

The hammer at the Yarra Bank Works can strike a blow equal to one ton, and can forge shafting up to twelve inches in diameter.

To this exhibit the Jury awarded a medal.

Mr. Williams also exhibits (see page 46, No. 1054) wrought-iron axles for waggons, bullock-drays, carts, &c., and, though lately commenced, has already made over 50 tons of axles. They are sold at 32s. per cwt., whilst the same descriptions of imported goods are sold at 34s., thus affording another instance that it is possible to compete in price with the imported article; and as to quality, the samples are everything that can be desired.

To this exhibit the Jury also awarded a medal.

Next in importance comes the manufacture of sheet lead and lead piping.

SHEET LEAD.

The only manufacturer of milled lead in this colony is Mr. John M'Ilwraith (page 43, No. 955). This industry was commenced in 1861. Previous to this date the cost of sheet lead averaged about £32 per ton, but the establishment of the Melbourne Lead Works had the immediate effect of reducing the price to £26 10s., thereby effecting a saving of £5 10s. per ton. The lead works have been erected at a cost of over £10,000, and are capable of turning out 50 tons of milled lead and 14 tons of pipe per week—a quantity far in excess of the demand. Since the commencement of this manufacture the works have turned out about 450 tons per annum, about one-fourth of which has been shipped to the neighbouring colonies. To this exhibit the Jury awarded a medal.

LEAD PIPES.

This branch of industry was commenced by Mr. James Coop, an exhibitor, in 1857, and by Mr. John M'Ilwraith in 1858, at which time the article was seldom sold under £35 per ton wholesale—often higher. The local-made

article was first sold at £32, and in a short time was reduced to £28, and again subsequently to the present price, £26 per ton.

The quantity made at the Melbourne Lead Works and by Mr. Coop exceeds 300 tons per annum, about one-fourth of which has been shipped to other colonies. Besides the exhibitors, Messrs. Coop and M'Ilwraith, there are other manufacturers in Melbourne, whose united capabilities are fully equal to supply 2000 tons per annum.

The Jury have awarded to Mr. James Coop, Melbourne (page 30, No. 505), a medal for lead and composition gas and water piping; also to Mr. John M'Ilwraith, Melbourne Lead Works, a medal for lead piping.

COLONIAL OVENS, KITCHEN RANGES, GRATES, &c.

There is a large and varied exhibit of these articles, for which exists an immense demand, one firm alone making over 2000 per annum. Great attention has been paid by the makers in adapting the ovens and ranges to the fuel most commonly in use (wood), as well as to the economy of fuel, the price and size, &c., to suit all classes. The workmanship in general is good—in some cases excellent. The material used is principally wrought-iron, which is both stronger and lighter for transit than cast-iron.

The prices at which they are made sets opposition by imported articles at defiance—as, for instance, a colonial oven measuring 24 inches by 18 inches by 12 inches can be supplied at 20s. each.

Mr. S. Earnshaw, Sandridge (page 23, No. 338), exhibits one 24-inch cast-iron oven, with hobs, the top and bottom strengthened by transverse ribs; price, £4 5s. One 24-inch cast-iron oven, without hobs, weighs about 100 lbs.; this oven has annealed cast-iron hinges; price, £2. One 3-feet squatter's oven, ribbed top and bottom, with polished brass mountings; price, £5. One 4-feet cottage range, with wrought-iron boiler to hold 12 gallons, with pans, plate-rack, ash-pan, &c.; price, £9. One double fire kitchen range, 14 feet long, with five large ovens with brass mountings, two high-pressure boilers for steam and water; weight, about 21 cwt.; price, £80. To this exhibit the Jury gave honourable mention.

Hughes and Harvey, Melbourne (page 23, No. 344).—Colonial oven, 2 feet 6 inches x 2 feet x 1 foot 6 inches. The front grate of this oven folds down so as to support the ends of long wood when used as fuel; it is all of wrought-iron, strengthened by angle iron; has wrought-iron trivets, is well made; price, £4. One colonial oven, 2 feet x 1 foot 6 inches x 1 foot, with bright mountings; 50s. each. One colonial oven, same size, with black mountings; 20s. each. The Jury awarded a medal to this exhibit.

William Hutchison (page 24, No. 345).—Patent Colonial Cast-iron Ovens, Registered Grates, Ornamental Castings.—One cast-iron colonial oven, 2 feet 6 inches x 1 foot 6 inches x 1 foot 3 inches, with two trivets, and link kettle holder; this oven is double cased; price, £3. One 38-inch chamber or parlour grate; price, 38s. One parlour grate, 38-inch, ground up and bronzed; price, 70s. One portable colonial oven, 24-inch; price, 34s.; with hobs, 12s. extra. Kitchen sinks and stench traps, Kennedy's patent, 6 inches square, 7s. each; 9 inches square, 10s. each. Balcony panels of good design, weight about 20 lbs. each; price, 6s. The Jury awarded a medal to this exhibit, for general excellence.

Thomas Nelson, St. Kilda (page 24, No. 348).—Enclosed Self-acting

Kitchener, Three-oven Range, with Grill.—This is an excellent article, and is so constructed as to use very little fuel. Instead of the usual fire lumps that generally compose the sides of the fireplace, it is supplied with wrought-iron boilers to supply hot water to the kitchen, scullery, and to the bath-rooms. The boilers are constructed on the high-pressure principle. On the left of the fireplace are two large ovens, fitted up complete with shelves, toasting hooks, and all other requisites. The grill is peculiarly constructed, and instead of having the usual iron gratings which form the furnace, it is formed by a number of wrought-iron tubes, which being kept filled with water, act in concert with, and assist the other boilers in supplying hot water elsewhere. The tubes being always filled with water last longer than the common fire bars. At the back of the fireplace is a steam boiler, which will supply steam for various domestic purposes. The front of the range is of wrought-iron, and the design and workmanship reflect credit on the exhibitor. Price, complete with all requisites, £90. The Jury awarded a medal to this exhibit for superiority of design and excellence of workmanship.

F. Wallis, Collingwood (page 24, No. 354).—Large Colonial Oven, 3 feet x 1 foot 6 inches x 1 foot 2 inches; price, £3. Colonial oven, 2 feet 6 inches x 1 foot 6 inches x 1 foot 3 inches; price, £2 10s. One range, with steamer, baking tins, gridiron, meat stand, plate rack, wrought-iron boiler with safety valve, saucepans, ashpan, &c., very complete and well made; price, £25. To this exhibit the Jury awarded a medal.

M'Callum Brothers, Melbourne (Harnwell, maker) (page 30, No. 529).—Colonial-made Ovens.—One colonial oven, No. 0, best bright, 3 feet x 1 foot 6 inches x 1 foot 3 inches, made of ¼-inch plate top, 3-16 bottom, with two shelves, scroll spring, brass ventilator, two bars on top; 52s. each; best black, same size, 48s. Other sizes in proportion to No. 7, 2 feet x 1 foot 4 inches x 10 inches, made as above; best bright, 25s.; best black, 23s. 6d. each. Common ovens, similarly made, No. 1, 2 feet 6 inches x 1 foot 4 inches x 10 inches; bright, 24s. 6d.; black, 23s. Other sizes in proportion to No. 6, 1 foot 6 inches x 1 foot 4 inches x 10 inches; bright, 15s. 6d.; black, 14s. each. The Jury awarded a medal to this exhibit.

Wm. Willis, Melbourne (page 31, No. 561).—Wine Stove.—To this the Jury awarded honourable mention.

HORSE SHOES.

With respect to this article, it was considered expedient to obtain the opinion of an expert; John Whiteman, Esq., V.S., was, therefore, associated with the Jurors. His report is as follows:—

I find the exhibits in this section very meagre, no shoes at all having been sent from Geelong, Ballarat, Sandhurst, or Castlemaine, and only one from Melbourne, where it is to be supposed the best shoeing smiths may be found.

The shoes from Tasmania show a desire in the exhibitors to *excel*, but, evidently from a want of knowledge of the first principle in shoeing—viz., the proper method of holding and adjusting—this work falls far below what its appearance would indicate to an inexperienced judge.

(Signed) JOHN WHITEMAN.

New Mode of Shoeing Horses, by R. J. Wilson, Flemington (page 24, No. 356).—This method of shoeing horses presents no advantage to my mind which would compensate for the difficulty of performing the operation, and so badly is the specimen shod which I have examined, that were it a live

foot it would ruin the horse. I look upon it as an absurd theory, and quite *impracticable generally.*

Five Sets Horse Shoes, M'Callum Bros., Melbourne (page 30, No. 529).—Very fair ordinary shoes. Worthy of honourable mention.

OVENS AND MURRAY.

Taylor, Samuel, Beechworth (page 53, No. 96).—Expanding Horse Shoes.—Idea not new; exploded long since. See "*Youatt on Shoeing.*" Workmanship good. Slipper for Hunting Fields, &c.—Idea old also; useful in case of losing a shoe, and in some diseases of the foot where a shoe cannot be nailed on. Racing Plate.—Very good. Worthy of honourable mention.

Williamson, William, Beechworth.—Set of Cart-horse Shoes (page 53, No. 98).—First class. Two Sets of Hack Shoes.—Very good. Worthy of a medal.

TASMANIA.

Beecroft, W., jun., Launceston (pages 77, No. 478).—Carriage-horse Shoes.—An immense amount of labour has been expended on these shoes uselessly, and in the wrong direction. The hind shoes present no level surface to the foot. The front ones are badly holed, and possess the same disadvantage. (Pages 77, 479, 482).—The above remarks will apply to these exhibits. The plates are very poor, and the bar shoe is made on a bad principle.

Davies, J., Launceston (page 77, No. 483).—This exhibit is a little better than the preceding, but shows a marked defect in the distribution and direction of the holes, and the surface presentable to the foot.

Thomas, David, Perth (page 84, No. 733).—The "Guerile" Horse-shoeing Instrument.—A very ingenious instrument, and one likely to prove very useful in cases of tender feet or fractious horses. Worthy of a medal.

CUTLERY.

In cutlery the Jurors regret to find that so interesting and lucrative a branch has been so indifferently represented, and evidently, as yet, has made but little progress in the Australian colonies. Only one exhibit appeared of this branch of our manufactures, and the Jurors had no option but to award a medal, although the articles shown were not of a high order of merit, either for utility or workmanship.

Many causes may be assigned for this deficiency. Sheffield now almost monopolises the cutlery trade of the world, although London still maintains its ancient supremacy in manufacturing the most reliable class of goods for an aristocratic, select, and exclusive trade.

The London-made table knives, surgeons' instruments, and, indeed, their edge tools generally, are pre-eminent for their superior quality, and command treble the price of corresponding articles of Sheffield make. Even in this market our butchers will buy or use no knives but Williams's London made, paying treble the price of the Sheffield article. So great a demand has arisen of late for these knives that large quantities have found their way here with forged brands and of inferior quality.

The Sheffield cutlers, as a consequence of the extreme subdivision of their labour, are not an emigrating class—they can rarely transfer their labour to another field—once out of their own quarters they are unable to make use of the particular item of labour to which they have been brought up from their infancy. A Sheffield cutler could obtain no employment in London or any of the provinces, because the London craftsmen, as well as the provincial, do not subdivide the labour on any one

article. A razor maker, for instance, forges his own blade, shapes, grinds, and finishes it, even to the handle; whereas in Sheffield many hands would be necessary to produce the same result, and so with all other articles. The London surgical trade is divided into many branches. The steel workers have two branches—the edge instrument maker, and the blunt ditto; besides which, there are workers in silver, leather, wood, &c.

Several excellent artificers as general cutlers and surgeons' instrument makers are in Melbourne, but their time is evidently occupied in attending to a jobbing and repairing trade, which at present offers them more certain remuneration than a competition with the importers of cutlery goods. Nevertheless, there is no doubt that many facilities exist in Victoria for the successful initiation of a cutlery manufactory. One or two items may be named which might find their way to public favour—viz., first-class ivory table knives on the London made model, and butchers' knives to compete with "Williams."

Many thousands of pounds' worth of these two items alone find a place annually in the imports to these colonies. Ivory would be required, and as other branches of trade require the same article, there is no doubt that some of our enterprising merchants would supply the want. The other materials used in the manufacture of cutlery and surgical instruments are easily procured, as horn, steel, tortoise-shell, pearl, fancy woods, &c. Once started, there is no doubt that a cutlery manufactory would beneficially absorb a large amount of our juvenile labour.

Grayson, John, Collingwood (page 23, No. 341).—Cutlery and Tools.—To this exhibit the Jurors awarded a medal.

The exhibits of japanned ware by Messrs. Hughes and Harvey (page 23, No. 344) are very creditable specimens of that peculiar art. The embellishments are of a superior description, and would bear favourable comparison with the best of home manufacture. The representations of colonial scenery are very well executed, and might be classed as specimens of high art. The articles in this exhibit are chiefly of a utilitarian description, comprising toilet sets, grocers' canisters, show bowls, baths, milk-cans, &c., &c. To this exhibit the Jurors have awarded a medal.

Mr. James Mathieson, of Bourke-street (page 23, No. 347), shows some excellent and substantial work in the articles of quarry hammers and masons' tools, including the mason's patent axe, by aid of which the workman is able to do considerably more work than if he were using the ordinary or common-place axe. Mr. Mathieson also exhibits miners' picks, which are generally preferred to any other kind. Large quantities of these are sent to New Zealand, and are to be found on all the diggings townships. To this exhibit the jurors have awarded a medal.

Messrs. Marsdon and Deacon, Fitzroy (page 30 No. 531), exhibit some very useful and excellent specimens of tools for plasterers and modellers. The plasterer's trowel is mounted in a superior manner to the American, which has hitherto been considered the best. The modelling tools are tastefully made, and of excellent shape and quality. A very neat and useful tool is also shown by these manufacturers—viz., a bootmaker's edge trimmer, which saves a great amount of time and labour, and is available for any size of edge. Another useful tool for coachmakers is also shown—viz., a

double-action leather washer-cutter, which cuts two different sizes at one time. To this exhibit the Jurors have awarded a medal.

Messrs. Rowden Brothers, Russell-street (page 31, No. 550), displayed an important and useful industry—galvanised tin and iron ware. Attempts have been previously made to establish this manufacture in Melbourne, but without success. Nothing daunted, however, Messrs. Rowden Brothers, after much trouble and great perseverance, have succeeded. They are now enabled to galvanise every description of iron work, which is of great utility where such articles are exposed to the action of air and water. To this exhibit the jurors have awarded a medal.

Mr. Peter Valot, of North Melbourne (page 31, No. 558), exhibits some excellent specimens of axes, which so closely resemble the American pattern that the best judges might be deceived. The quality is guaranteed, being made of the finest steel and properly tempered. To this exhibit the Jurors have awarded a medal.

BRUSHWARE.

The brushware exhibited by Messrs. Zevenboom & Stone, and manufactured by them in Melbourne, deserves special attention, not only for the excellence of the articles shown, but for the importance of this rising branch of industry in a monetary point of view, as will be seen from the fact that in 1864 this item alone of our imports reached the large sum of £40,000. Mr. Zevenboom commenced the manufacture of brushware in Melbourne in 1864. At first his efforts were necessarily of a very limited character, a great drawback to his first attempt being the want of the necessary raw material, unfortunately not used or required in any other branch of industry then in existence—viz., bristles, cocoanut fibre, Mexican fibre, bass, and whalebone. The first of these comes from Russia, cocoanut fibre from Colombo, white fibre from Mexico, bass (a species of native grass) from Bahia, and the requisite species of whalebone from England. The importers of this class of goods occasionally experience great inconvenience in keeping up a stock of the necessary articles suitable for this market, the difficulty arising from their great variety. Mr. Zevenboom directed his first efforts to the most homely and useful kinds of brushware, especially such as were in general demand in the colony—viz., machinery brushes (comprising many kinds) and every description of brushes for household and stable use. His present list comprises these few items only, consisting altogether of about twenty different descriptions. The woods used are blackwood, cedar, and kauri and huon pine. Mr. Zevenboom expects in a short time to extend his list by the production of some of the finer specimens, such as tooth, hair, nail, clothes, and paint brushes, &c. The factory at present employs about twenty hands, men and boys. The brushware of the class here exhibited (page 31, No. 565) is now successfully established in this market, and the manufacturer asserts that he is able to compete in price and quality with imported goods of the same character. The Jurors awarded a medal to this exhibit.

M'Mahon, M., George-street, Sydney (page 66, No. 212), also exhibits samples of brushware, to which the Jurors awarded a medal. (The Reporter regrets that he has no information enabling him specially to refer to the introduction of this branch of manufacture in the sister colony.)

Sparey and Bryant, Melbourne (page 24, No. 351).—Galvanised Iron, Guttering, Ridging, Down Pipes, Cistern Heads, &c.—A very excellent exhibit of the above articles, reflecting great credit on the manufacturers for the workmanlike manner in which they were finished. The Jury awarded a medal.

Fletcher, Joseph, Melbourne (page 30, No. 508), exhibited a cylindrical grain separator, to which the Jurors awarded a medal.

Reaney and Roberts (page 31, No. 548).—Fire-proof Safes, manufactured in Melbourne.—To this exhibit the Jury awarded a medal.

Scott, J., Hawthorn (page 31, No. 553).—Portable Self-heating Bath.—A very excellent article, well adapted for families, schools, hospitals, &c. The Jury awarded a medal.

STILLS.

Nitschke, W., Adelaide (page 86, No. 32).—Large Distilling Apparatus.—A very superior piece of workmanship, to which the Jury awarded a medal.

Goby, Arthur, Melbourne (page 43, No. 947).—Portable Still.—Awarded a medal.

Scott and Co. (page 43, No. 962).—Rectifying Still, made by the apprentices at the Melbourne Copper Works.—To this exhibit the Jurors also awarded a medal.

M'Cape, Arthur R., Beechworth (page 53, No. 95).—Two Models of Safety Hooks.—The jurors awarded a medal to the exhibitor, and beg to call the attention of the mining community to the principle upon which the hooks are made. The same ingenious inventor also exhibits a safety stirrup-iron and a pair of tailors' shears, constructed on a new and improved principle. The Jurors considered them worthy of honourable mention.

Bannister, R. D. (page 23, No. 327).—Horned Purchase Hook.—The jurors considered this worthy of honourable mention.

NEW SOUTH WALES.

Fitzroy Iron Mining Company, N.S.W. (page 58, No. 24).—This company exhibited pig-iron, and round and square bar-iron, manufactured at their works. To them the Jury awarded a medal.

Russell and Co., P.N., Sydney (page 65, No. 184), exhibited samples of iron castings from the Fitzroy Iron Mines, consisting of royal arms, garden chairs, panels for balconies, &c., to which the Jury awarded a medal. The same firm exhibited a large cast-iron bell, to which the Jury also awarded a medal.

BROOMS OF MILLET, GRASS, FERN-TREE, AND LEAVES OF THE CABBAGE PALM.

The manufacture of brooms from the above substances may be termed a new industry, and the manufacturers can supply an article, so far as quality is concerned, that equals the best imported American. To those exhibited by Creer, Joseph, West Maitland (page 66, No. 208), the Jurors awarded a medal.

Swain, W. (page 52, No. 75), exhibits samples of grass and ferntree brooms, considered by the Jurors worthy of honourable mention.

Kratz, H., Grafton, New South Wales (page 66, No. 211), and Steather, James, Camden, New South Wales (page 66, No. 226), exhibit millet

brooms, both samples of which the Jurors considered worthy of honourable mention.

Moore, Charles, director Botanical Gardens, Sydney (unclassed), exhibits samples of brooms made from the leaves of the cabbage-tree palm. To these the Jury also awarded honourable mention.

Howden, A., Launceston, Tasmania (page 77, No. 475), exhibits a pocket filter for the bush, to which the Jury awarded a medal.

Newhouse, J. (page 112, No. 24), exhibits a collection of reaping and mowing machines and chaffcutting knives, manufactured by the exhibitor. The manufacture of these knives in the colony is of considerable importance. The Jury awarded a medal.

Sheath Brothers (page 112, No. 28) exhibit patent self-supplying water brushes, used principally for cleaning horses, cars, carriages, and other conveyances. To this important and novel application the Jury awarded a medal.

Brown, Walter (page 23, No. 331).—Tailors' Self-heating Iron, invented by the Exhibitor.—To this exhibit the Jurors awarded a medal.

Stewart, George (page 31, No. 355).—Japanned Goods.—The Jurors considered this exhibit worthy of honourable mention.

Scotson, S., Castlemaine (page 31, No. 552).—Pick and Axe Handles, machine made.—Awarded honourable mention.

Willis, William, Melbourne (page 31, No. 561), exhibited a stove for heating wine, and for general heating purposes, to which the Jurors awarded a medal.

For remainder of notices of honourable mention see *Epitome* of awards.

ALEX. KENNEDY SMITH, REPORTER.

The following table of imports appertaining to this section may be studied with advantage by those who are engaged in such industries. The importation of brushware and sheet lead we may expect to see diminish; while the large amount expended on powder suggests its local manufacture, or that of some suitable substitute for that explosive compound. Mr. John Young is successfully manufacturing locks of a very superior kind, and it is manifest, that a considerable portion of the quarter of a million spent on ironmongery might be kept within the colony.

Article.	1860.	1861.	1862.	1863.	1864.	1865.	1866.
	£	£	£	£	£	£	£
Hardware and Ironmongery	382,444	260,407	244,763	358,577	366,133	358,762	259,661
Brushware	29.619	23,554	31,199	31,007	23,801	28,726	20,949
Lead Pipes	3,489	103	861	3,571	1,988	794	2,343
" Sheet	23,077	12,696	10,048	9,419	10,545	6,028	12,564
Powder, Blasting and other sorts	91,811	46,295	21,805	17,271	27,120	55,536	43,921
Tinware	4.778	1,995	1,112	794	2,520	3,687	2,698
Holloware	18,025	14.173	7,858	18,278	16,027	20,009	13,604
		gals.	gals.	gals.	gals.	gals.	gals.
Kerosene	...	113,908	233,061	403,161	377,665	617,742 1600 c'ses	733,076

The growing consumption of kerosene, as here shown, plainly indicates the extent of the field which is open for the colonial manufacture of that article, an abundant supply of the finest shale being procurable in New South Wales.

The following is the List of Awards in this Section :—

MEDALS.—VICTORIA.

326 Amos, Robert, Melbourne.—Rolled and Hammered Iron.
331 Brown, Walter, Melbourne.—Tailor's Self-heating Iron.
505 Coop, James, Melbourne.—Lead and Composition Gas and Water Piping.
508 Fletcher, Joseph, Melbourne.—Grain Separator.
340 Garbutt, Joseph, Carlton.—Hames, manufactured by exhibitor.
341 Grayson, John, Collingwood.—Cutlery and Tools.
344 Hughes and Harvey, Melbourne.—Wrought-iron Ovens and Japanned Ware.
345 Hutchison, William, Melbourne.—Cast-iron Ovens and Grates.
531 Marsdon and Deacon, Fitzroy.—Plasterers' Trowels and various Tools.
529 M'Callum Brothers, Melbourne (Harnwell, maker).—Colonial-made Ovens.
95 M'Cape, Arthur R., Chiltern.—Two Models of Safety Hooks.
955 M'Ilwraith, John, Melbourne.—For manufacture of Sheet Lead.
347 Mathieson, James, Melbourne.—Masons' and Mining Tools.
348 Nelson, Thomas, St. Kilda.—Enclosed Kitchener.
24 Newhouse, T., Melbourne.—Reaping, Mowing, and Chaff Knives.
548 Reaney and Roberts, Melbourne.—Fire-proof Safe.
550 Rowden Brothers, Melbourne.—Galvanised Ware.
553 Scott, James, Hawthorn.—Portable Self-heating Bath.
24 Sheath Brothers, Melbourne.—Patent Self-supplying Water Brushes.
351 Sparey and Bryant, Melbourne.—Galvanised Iron Guttering, Ridging, &c.
558 Valot, Peter, Hotham.—American Axes.
354 Wallis, F., Collingwood.—Colonial Ovens and Ranges.
355 Weigmann, A.—For Wicker and Cane Work.
1054 Williams, William, Yarra Bank Works, Melbourne.—Two Axles.
559 Williams, William, Yarra Bank Works, Melbourne.—Massive Hammered Shafting, Wrought-iron Forgings, and Cranks.
98 Williamson, William, Beechworth.—Horse Shoes.
561 Willis, William, Melbourne.—Wine Stove, adapted for general heating purposes.
565 Zevenboom and Stone, Melbourne.—Brushware. The show this firm has made is eminently successful, and is actually a credit to the colony. A medal is hardly sufficient reward.

HONOURABLE MENTION.—VICTORIA.

327 Bannister, R. D.—Horned Purchase Hook.
92 Clarke, R., Beechworth.—Multiple Mortice Gauge.
35 Connelly, T. J., Sandhurst.—Tinware.
773 Doggett, Thomas, Hotham.—Tubular Screw-adjusting Bedstead.
338 Earnshaw, S., Sandridge.—Cooking Range and Ovens.
43 Holdsworth, J., Sandhurst.—Pick Handles.
37 Jones, John, Sheepshead.—Driving Picks.
529 M'Callum Brothers, Melbourne.—Horse Shoes.
95 M'Cape, Arthur R., Chiltern.—Safety Stirrup-iron and Tailor's Shears.
552 Scotson, J., Castlemaine.—Pick and Axe Handles, machine made.
555 Stewart, George, Melbourne.—Japanned Goods.
75 Swain, W.—Grass and Fern-tree Brooms.
96 Taylor, Samuel, Beechworth.—Racing Plate.

MEDALS.—NEW SOUTH WALES.

208 Creer, Joseph, West Maitland.—Brooms.
24 Fitzroy Iron Company, Fitzroy.—Pig and Bar Wrought Iron.
212 M'Mahon, M., Sydney.—Brushware.
184 Russell, P. N., and Co., Sydney.—Iron Castings and Cast Steel Bell.

HONOURABLE MENTION.—NEW SOUTH WALES.

211 Kratz, H., Grafton.—Millet Brooms.
— Moore, Charles, Director Botanical Gardens, Sydney.—Brooms made from Leaves of Cabbage-tree Palm.
226 Steather, James, Camden.—Millet Brooms.

MEDALS.—TASMANIA.

475 Howden, A., Launceston.—Pocket Filter, for the bush.
63 Jackson, A., Ross.—Grindstones of white freestone from Ross.
61-2 Pittfield, J., Kangaroo Point.—Two Grindstones, well dressed and of excellent material.
733 Thomas, David, Perth, near Launceston.—Horse-shoeing Instrument.

HONOURABLE MENTION.—TASMANIA.

60 Birth and Co., Hobart Town.—Grindstone, brown freestone.

HONOURABLE MENTION.—SOUTH AUSTRALIA.

98 Mellor, Joseph, Adelaide.—Gate Hinges.

HONOURABLE MENTION.—QUEENSLAND.

23 Mitchell, Graham, Brisbane.—Horse Shoe.

LEATHER.

Class IV.—Section 12.

I. G. REEVES, ESQ., M.P., CHAIRMAN.

T. ADAMSON, ESQ.
R. BARRY, ESQ.
C. BULLY, ESQ.
R. BURROWS, ESQ.
G. R. FINCHAM, ESQ.
T. LAMBERT, ESQ.
S. LOWE, ESQ.
J. CARSON, ESQ.
G. CUNNACK, ESQ.

THE Jurors feel much pleasure in being able to state their approval of most of the exhibits, particularly the white and black kangaroo kid; also the white buckskin and imitation in kangaroo from Tasmania.

The exhibits from Sydney include very superior samples of japanned and enamelled leathers, highly creditable to the exhibitors.

Western Australia has forwarded exhibits highly creditable to the colony, particularly its brown basils.

The South Australian exhibits the Jurors do not consider worthy of any special mention.

The Victorian exhibits, as might be expected, were large and varied, embracing almost every article in leather. The improvements in the manufacture were marked, as compared with former exhibits, especially in colonial and fancy leathers.

I. G. REEVES, CHAIRMAN AND REPORTER.

The Report of the Jurors on the leather shown at the Great Exhibition of London, in 1862, contains many valuable comments on the development of the above trade, as will be seen by the following extracts :—

"In countries or cities that are extremely wealthy and with a superabundant population, the division and sub-division of certain labour becomes (in order to ensure a profit on manufacture) a necessity. They may always be commanded with facility, and can be brought to bear on the perfecting of such goods as are required either for the wants of society or its luxurious superfluities. Skilled labour, therefore, in every department of manufacture is sure to find its remuneration; whilst amidst a sparse or

poor class of people it would soon cease to exist. The producer's—or, to coin a word, the semi-manufacturer's—skill, then, is rather shown by a keen perception or judgment in selecting from what are termed technically in England 'goods in the rough,' than in the simple manufacture of the raw material into a saleable condition. The nice manipulation which creates the beauty of the finished article in its progress from the rough to the marketable state may be compared to the last touches of the sculptor on the statue, which has been shaped from the original block of marble into form by ruder hands than his; upon these finishing strokes of the mallet and chisel rests the fame of the master hand. In this as well as some neighbouring countries, sub-division of labour is understood thoroughly and applied constantly, so that there are in reality very few who produce the finished article from the raw material, the practice (especially in what is termed the 'heavy' portion of leather manufacture) being to despatch the leather from the tannery to the market in the rough, where a class of producers buy, and then make such an appropriation of their purchases as their matured experience may suggest, thus becoming manufacturers only in the second degree. Hence we have our special trades, such as the currier, the leather-dyer, and the finisher, and the renown of the master depends mainly on the ability of the men, whose pre-eminent excellence in their specific arts is acquired by concentrating their attention to but one particular line of work.

"Among a highly-commercial, wealthy, and enterprising people, no stone is left unturned in order to obtain every variety of artisans skilled in perfecting all kinds of leather; and but few of our larger leather works are to be found without either French or German workmen, attracted hither by higher wages, combined with a desire to acquaint themselves with the methods in use in our tanneries or leather-dressers' establishments. It has become a common remark that good leather is only a matter of £. s. d.; it would, however, be more true if to that were added that much depends on a sound judgment, exercised with a judicious expenditure of money, and in knowing how to appreciate or select each operative. Upon this combination is established the basis of a sound reputation. A manufacturer, however, must above all know in what is the true perfection and refinement of his art, without which no success can be permanently achieved.

"No attempt whatever has been made by the jury to ascertain or compare the price of leather of the same order in different localities. Leather, as a manufacture, is an exceptional article, incapable of being wrought up to a specific standard, as is the case in such articles as cotton, hosiery, or broadcloths. Skins of animals of the same order are never found exactly alike—each has its good or bad points in a lesser or greater degree; yet, taken in the bulk (from one to a hundred dozen), their value can be ascertained with extreme certainty and correctness.

"As it happens with individual skins, so it does with the bulk when offered for sale; and there is a wide undefinable scale of value. To the uninitiated, perhaps, the best idea of the wide difference of value may be conveyed by directing their attention to a pamphlet issued within the present building, by one of the chief leather houses in London, whose trophy adorns the nave; their quotations for morocco skins being from 44s. to 108s. per dozen, and strained sheepskin skivers at from 6s. to 20s. per dozen.

"Of the colonies the Jury observe, that considerable advance has been made towards producing articles that may one day rival the products of the mother country—the useful articles for daily use or consumption taking of course a precedence over the ornamental or the beautiful. The manufactures of New South Wales are highly satisfactory,. A medal has been awarded to exhibitor 269, and honourable mention to others. The firm of Hall and Anderson exhibit a series of varied goods, some of which are scarcely below the standard of European excellence. The jury are gratified in being able to give unqualified praise to the general superior tannage of New Zealand, New South Wales, and of Western Australia. The productions of Victoria are highly commended."

The following is a return of the imports of leather, and it is to be hoped that this item will soon disappear from the Customs returns:—

Article.	1860.	1861.	1862.	1863.	1864.	1865.	1866.
	£	£	£	£	£	£	£
Leather	8,700	10,718	8,798	6,570	4,586	17,294	8,875
" Fancy	....	....	....	....	....	240	10,402

The following is the List of Awards in this Section:—

MEDALS.—VICTORIA.

359 Brearley Brothers.—Superior excellence in Sole Leather and Dressed Skins.
364 Clark, John, and Sons.—1st. Superior excellence in quality and variety of all descriptions of Leather exhibited used by the harness and saddlery trade. 2nd. Superior excellence in quality and variety of Leather used by boot and shoe-makers. 3rd. Superior excellence in quality and variety of colours in the Fancy Leather department and Dressed Skins.
369 Farrell, James.—Superior excellence in quality and variety of colours in the Fancy Leather department, and Blocked Fronts.

HONOURABLE MENTION.—VICTORIA.

373 Hallenstein and Co.—Leather.

MEDAL.—NEW SOUTH WALES.

186 Alderson and Sons, Sydney.—Japanned and Enamelled Leathers.

MEDALS.—TASMANIA.

497 Elliott, G. H.—Kangaroo Kid.
505 Murray, W.—Waxed Kangaroo.

MEDAL.—WESTERN AUSTRALIA.

132 Ranford, B. B.—For dressed Shoe Leather, Skirt Leather, and brown Basils.

SADDLERY AND HARNESS.

Class IV.—Section 12 a.

CAPTAIN FREDERICK C. STANDISH, CHAIRMAN.
SAMUEL LOWE, ESQ. | HON. JOHN M'CRAE.
JAMES COWIE, ESQ.

In submitting our Awards in the Section of Saddlery and Harness, we have much pleasure in stating that the various articles of saddlery and harness which we have examined reflect the greatest credit on the exhibitors, and are an indication of the flourishing state of the trade in Victoria.

The increasing taste which appears to prevail for saddlery and harness of colonial manufacture is testified by the great increase in the number of persons following the trade, and will, doubtless, before long tend greatly to decrease the imports of such articles from Great Britain.

We are informed that English saddlery, constructed after the design usually adopted in our colony, is imported and sold here as of colonial manufacture.

The exhibitors from Victoria number fourteen. They display various degrees of excellence, while the articles they exhibit show a marked improvement on those which appeared at the Exhibition of 1861. Indeed, the quality of the workmanship, and the taste displayed in the more costly exhibits, convince us that Victoria has little to fear from competition with the importers from any other country.

The decrease in the value of imports for the past six months of last year, as compared with previous years, appears to us as indicative of a demand for colonial saddlery, and we have no doubt that, if production is further stimulated, we shall soon become independent of foreign importation.

Messrs. M'Farland and Sons exhibit a varied assortment of saddlery and harness, which would vie successfully with the produce of the first workshops in Great Britain. We may particularise a handsome set of buggy harness, which for exquisite workmanship and tasteful design leaves nothing to desire.

Messrs. Loader and Co. display a large case of colonial-made saddlery, whips, &c., which we consider most creditable to this enterprising firm.

Messrs. Killmeister and Purdue's collection contains a Somerset side-saddle of great excellence, and a set of buggy harness of very good workmanship.

The exhibitors from the adjoining colonies are only five in number—viz., three from New South Wales, one from Tasmania, and one from Queensland.

Mr. John Brush, of Sydney, exhibits a lady's quilted side-saddle of first-class workmanship, for which we have awarded him a medal.

In concluding our labours, we have to congratulate the colony on the rapid strides which this branch of trade has been making during the last few years.

We have also to thank the exhibitors for the assistance they have afforded us in our examination of the various articles exhibited.

FREDK. C. STANDISH, Reporter.

In referring to the Reports of the Jurors of the Great Exhibition of London in 1862, we find the following observations on saddlery, &c., which may be appropriately transferred to these pages:—

"We have to remark that few novelties or inventions have been submitted to us; with some few exceptions the saddlery and harness manufacture in these particulars remains as it was at the period of the last Exhibition. We mention the fact not for the purpose of attributing blame to those engaged in the trade, but at the same time with a hope that, their attention having been called to the fact, the manufacturers may consider the possibility of progress in their art.

"We notice with pleasure that in the British dependencies great exertions are being made to produce articles of saddlery, &c., suitable for the purpose to which they are to be devoted.

"From various parts of Australia saddles, &c., are exhibited. They are strong, well made, and suitable for the work for which they are designed; and when the short time during which the trade has existed in those regions is considered, we think the manufacturers are deserving of great commendation."

The following return from the Customs gives the importation of saddlery into Victoria for several years; and it is gratifying to see that a great falling off has taken place:—

	Saddlery.		Saddlery.
1860	£71,135	1864	£91,624
1861	62,190	1865	56,890
1862	62,684	1866	39,296
1863	61,561		

The following is a List of Awards in this Section:—

MEDALS.—VICTORIA.

380 Killmeister and Purdue, Ballarat.—Somerset Side-saddle of superior excellence.

383 Loader, Thomas, and Co., Melbourne.—General exhibit of colonial-made Saddlery and Whips.

386 M'Farland and Sons, Melbourne.—Superior excellence in Saddlery and Harness.

HONOURABLE MENTION.—VICTORIA.

358 Blanchard, Charles, Melbourne.—Two colonial-made Saddles of creditable workmanship.

360 Brodie, David, Melbourne.—Harness Collars of superior make.

374 Hatton, J., Melbourne.—Various improvements in Cab Harness.

379 Kerr, Thomas, Footscray.—Case of Saddles of colonial manufacture.

380 Killmeister and Purdue, Ballarat.—Set of Buggy Harness of creditable workmanship.

401 Windover and Davis, Ballarat.—Saddlery of creditable workmanship.

MEDAL.—NEW SOUTH WALES.

190 Brush, John, Sydney.—Quilted Side-saddle of colonia manufacture and first-class workmanship.

BOOTS AND SHOES.

Class IV.—Section 12 b.

JOHN CARSON, ESQ., J.P., CHAIRMAN.

A. ANDERSON, ESQ. | D. BROWN, ESQ.
R. BARRY, ESQ. | JACOB HARRIS, ESQ.

W. MILNE, ESQ.

THE number of exhibits in this class is very small, Queensland, New South Wales, Tasmania, and Victoria being the only exhibitors.

The most noticeable features are that the exhibitors have aimed almost exclusively at producing superior workmanship in cutting, closing, and making, and that there has been great apathy on the part of manufacturers of such goods as are in general demand, the production of these colonies.

Where such goods have been sent no price has been given; the Jurors, therefore, have not had an opportunity of making awards on the grounds which to them seem most of all desirable—namely, quality in connection with cost. Our acquaintance with the business leads us to believe that there is a marked advance in the quantity of goods manufactured in the colonies, and that the improvements and facilities attending the use of sewing machines for the manufacturing of tops, and the new system of riveting the soles, give great advantages in producing boots and shoes suitable to the requirements of the colonies.

In strong goods the colonial-made article is superior to the imported, which it has already supplanted; and in plain goods for ladies and children there is a largely-increasing manufacture.

We desire that it should be well known that the principle established in England and elsewhere for the guidance of Jurors in making these awards is not competitive, whereby one medal only is given, placing such award at the head of a section, but that it is on the broad and liberal basis, that wherever excellence is found a medal should be given, and for goodness honourable mention. Approving cordially this mode of judging, we are of opinion that had it been generally known that merit, under whatever conditions, would be equally entitled to award, the majority of colonial manufacturers would have been exhibitors.

JOHN CARSON, REPORTER.

None of the imports which are quoted in these reports show a more gratifying state of colonial industry than that of boots and shoes. The following Customs return plainly demonstrates the progress we are making in this important branch of trade :—

	Boots and Shoes.		Boots and Shoes.
1860	£706,903	1864	£572,410
1861	617,262	1865	632,448
1862	767,683	1866	358,083
1863	618,776		

The following is a List of Awards in this Section :—

MEDALS.—VICTORIA.

396 Thomas, Paul, Melbourne.—For excellence in Gentlemen's Boots.
397 Thomas, S., Melbourne.—For very superior workmanship.
394 Sanders, John, Sandridge.—Excellence in Ladies' Fancy Boots and Shoes.

HONOURABLE MENTION.—VICTORIA.

362 Champ, Colonel W.—For Boots and Shoes of good workmanship, made by prisoners at Pentridge.
— Harris and Heymanson.—For price and quality of strong colonial work.
— Rolls and Son.—For price and quality of Youths' and Men's strong Colonial Boots.

MEDAL.—NEW SOUTH WALES.

191*a* Cocksedge, T. Z.—For excellence of one pair Wellingtons.

HONOURABLE MENTION.—NEW SOUTH WALES.

197 Lobb, John.—For Elastic Balmorals.

HONOURABLE MENTION.—TASMANIA.

533 Sly, John.—For good closing and fancy cutting.

PORTMANTEAUS, AND OTHER APPLICATIONS OF LEATHER.

Class IV.—Sub-section 12 d.

G. M. BRADSHAW, ESQ., CHAIRMAN.
S. LOWE, ESQ. | T. LOADER, ESQ.
T. LAMBERT, ESQ.

MEDALS.

392 Pausacker and Evans.—For general excellence of Exhibits.
833 Wickes, T. B.—For variety and finished workmanship in Despatch Boxes, Pocket Books, Leather Cases, &c.

HONOURABLE MENTION.

390 Murphy, Michael.—For burglar-proof Portmanteau.

FABRICS IN SILK, WOOL, COTTON, HAIR, FLAX, HEMP, STRAW, SPUN, WOVEN, FELTED OR LAID, PLAIN OR MIXED; ARTICLES OF CLOTHING, LACE, EMBROIDERY, AND SPECIMENS OF NATIVE INDUSTRY.

Class IV.—Sections 13 and 14.

THOMAS ALSTON, ESQ., CHAIRMAN.
J. G. ANDERSON, ESQ. | R. H. COOLING, ESQ.
S. F. PIKE, ESQ.

We have the honour to report that we have carefully and closely examined every article named in the sections allotted to us, and in determining our awards have been guided by a desire to do justice to every exhibitor. In many of the different classes of exhibits shown, the approximation as regards excellence has been so close that it has been a very

difficult matter to decide which should have the preference, and in none more so than the exhibits by the various manufacturers of hats, and which we consider reflect as much credit on the Exhibition as any of the goods that came under our notice.

FABRICS IN WOOL.—In this branch of the Exhibition there is a marked improvement in the manufacture. There are three exhibits all exceedingly good; few could pass them without their attention being drawn to their quality and apparent strength. One very great drawback in the manufacture of woollen fabrics for years past has been in the very inferior designs used, but such is now in a great degree removed by Mr. O. B. Ebsworth, of New South Wales, although there is still room for improvement in that respect. When once the designs come to bear favourable comparison with the home products, we are of opinion that home exportation of woollens to these colonies will become less and less yearly.

ROPES AND TWINES.—The specimens of rope exhibited seem to possess all the qualities necessary to recommend them for practical use, and reflect great credit on the exhibitors; this is one of the many branches of industry most likely to carry out the objects of the Exhibition, and be of practical benefit to the colony.

MATERIAL MADE FROM THE HAIR OF THE ANGORA GOAT.—These clothes are of a beautiful texture, and if they had been of colonial manufacture, would certainly have been entitled to a medal.

HAIR.—This is another class of exhibits where all are nearly on a par with each other, and all exceedingly good, the wigs, scalps, &c., being very fine, and showing much care on the part of the exhibitors. Another class of hair, curled for manufacturing purposes, is shown; and again, hair brooms, &c., by Messrs. Zevenboom and Stone, of which we cannot speak too highly, considering them much superior to anything of the kind imported. There is also a very good specimen in the New South Wales Court.

BERLIN WOOLS.—This is a class of exhibits in which there is more diversity of character than in any other. A few are good, amongst which we notice "Bolton Abbey," in the New South Wales Court; "Happy Time," in the Tasmanian Court; "The Return from Hawking," in the Victorian Court, and several in the name of David Johnston; one or two others are passable, the bulk mediocre, and a few very indifferent.

STAYS.—All the specimens possess merit, and we hail them as opening up a large and lucrative means of employment for our female population.

LACE, CROCHET, &c., &c.—Some of these exhibits possess considerable merit.

MANTLES AND MILLINERY.—Amongst the exhibits in this class there are certainly some very creditable specimens of colonial workmanship.

SLOPS AND CLOTHING.—There is no other class of exhibits in the present Exhibition showing such a marked improvement upon the last as slop clothing. The articles exhibited by Sargood, King and Sargood would be a credit to any Exhibition, and are decidedly superior to anything that we have ever seen of the kind. The shirts also deserve special mention for the manner in which they are dressed. The style and quality of the work displayed surpass those of most articles of the same kind imported from foreign markets, and form an introduction to a colonial industry giving more employment than almost any other.

PENAL ESTABLISHMENT.—It would be impossible to notice all the exhibits from Pentridge; but it would be an injustice to overlook the

many specimens of useful articles contained among them; had we to particularise in our own section, we should select the white blanket, the cabbage-tree hats, and the clothing. We consider great credit due to Colonel Champ for the evident care bestowed upon the due employment of the prisoners under his charge.

STRAW HATS.—The show in this class is very good, and we cannot help particularising the excellent cabbage-tree hat, made by Mr. Woolnough, in the New South Wales department; it is certainly the finest of the kind we have ever seen. This is another branch of industry which will employ a vast number of our female population.

To conclude, we have every reason to be satisfied with the exhibits in all the different departments, and taking it as a whole, it is a decided success. The specimens of colonial manufactures which are here shown prove incontestably that there are very few articles of ordinary use that cannot be made in these colonies; and a little judicious encouragement to our colonial manufacturers for a few years would render us entirely independent of foreigners, would open up sources of employment for our population, would give us increased facilities for the transaction of business amongst ourselves, and would attract population from the overcrowded and stifling cities in Europe to our shores—a very great desideratum to our colony, and for the want of which a young community languishes.

All man's wants, necessities, comforts, and even luxuries, are here displayed, the whole being of colonial material or workmanship.

THOMAS ALSTON, CHAIRMAN AND REPORTER.

To show the great field for colonial enterprise in the branches of production which come under the head of clothing, the following table of imports is taken from the Customs returns :—

Article.	1860.	1861.	1862.	1863.	1864.	1865.	1866.
	£	£	£	£	£	£	£
Apparel and Slops	586,570	490,466	338,508	344,460	186,860	488,756	517,157
Woollens	197,170	162,526	206,409	235,941	191,551	509,724	601,634
„ Piece Goods	—	—	—	—	—	—	874,260
Cordage	59,852	28,658	68,249	61,189	46,565	86,075	98,088
Twine	4,977	3,019	6,553	14,658	12,410	12,247	15,075
Hats, Caps, Bonnets	70,207	69,316	58,101	68,574	52,876	126,710	183,132

The following is a List of Awards in this Section :—

MEDALS.—VICTORIA.

— Bakewell, Mrs.—Wool Work.
466 Benjamin, Mrs. B.—Ladies' Stays.
469 Blackmore, M.—Oil Clothing.
471 Carter, Wm.—For his Case exhibiting the process of Crochet Work.
474 Claridge, Mrs.—Roman Point Lace.
846 Campbell and Graham.—For Superiority in the Manufacture of Wigs, Scalps, &c.
412 Donaghy, Michael, Geelong.—Rope.

418 Ford, Brothers.—Washing Hats.
484 Henderson, Samuel.—Quilted Hats and Crinolines.
485 Hill, Mrs. M. C.—Ladies' Underclothing.
488 Martin, C. R.—Military Embroidery.
433 Mealey, Elizabeth, and Daughter.—Straw Hats and Plait.
434 Millar, T., and Co.—Rope Making.
443 Prevost and Bessieres.—Wigs, Fronts, Head Dresses
491 Runge, Madame.—Ladies' Dresses.
445 Robertson, John.—For Dyeing.
448 Sargood, King and Sargood.—Slop Clothing and Shirts.
492 Stewart, Mrs.—Ladies' Stays and Belts. The belts are excellent for comfort.
41 Teskey, Miss, Sandhurst.—Knitted Quilt.
459 Tronson and Hill.—Woollen Flocks and Shoddy. Excellence of manufacture.
461 Wallworth, S.—Superiority in the Manufacture of Hats.
464 Williams, Adeline A.—Knitting.
131 Williamson, John.—Curled Hair.

HONOURABLE MENTION.—VICTORIA.

89 Acclimatisation Society.—For Alpaca Cloth.
— Allen, Mrs., Mechanics' Institute, Prahran.—Cushion Lace.
402 Annear, Ursula.—Wool Work.
467 Bethune, Mrs.—Colonial-made Stays.
470 Bright and Hitchcock.—Mantles and Millinery.
408 Cronin, Benjamin.—Millinery.
405 Champ, Colonel, Pentridge.—For Blankets and Coverlets.
477 Decourtet, Madame E. Soulie.—Dressmakers' Manufactures and Stays.
— Dickson, Miss, Upper Hawthorn.—Cushion Lace.
849 Eve, John Samuel.—Hair Work and Dye.
478 Finlayson, Mary.—Imitation Point Lace. A very beautiful specimen.
417 Fletcher, John.—For Case of Hats and Caps.
419 Fraser, Elizabeth.—Wool Work.
421 Freemantle, Mrs.—Wool Work.
479 Galvin, John.—Manufacture of Hats and Caps.
480 Geach, E.—Blonde Lace and Ties.
669 Giles, Annie M.—Wool-work Picture.
482 Goodheim, Sampson.—Cloth Caps.
483 Hargreaves, Mrs.—Needlework.—Bed and Watch Pockets, Sofa Cushion.
430 Kincaid, John.—Rope and Halters.
431 Long and Co.—Baby Clothes.
436 Neighbour, Mary.—Needlework.
437 Oates, Miss A.—Crochet Work with Raised Flowers.
541 Officer, C. M.—Exhibit of Native Weapons.
444 Rees, Miss.—Specimens of Tatting.
446 Ramsay, J.—For patience in the making of a Hearthrug.
447 Robinson, L., and Co.—Mantles and Millinery.
449 Say, W. B.—Straw Hats.
864 Sergeant, James.—Berlin Wool Work.
453 Solcberg and Sons.—Slop Clothing.
473 Thomas, W.—For his Exhibition of Aboriginal Products.

Ovens and Murray.

72 Banfield, E. B.—Crochet Work.

MEDALS.—NEW SOUTH WALES.

209 Ebsworth, O. B.—For his continued improvements in the manufacture of Colonial Tweeds.
224 M'Mahon, M.—For Fancy Combs, Brushes, &c., &c. A very superior sample.
217 Woolnough, Horace.—Cabbage-tree Hat. A more beautiful specimen of cabbage-tree hat we have never seen.

HONOURABLE MENTION.—NEW SOUTH WALES.

287 Andrews, Mrs. William.—"Bolton Abbey," in Berlin Wool Work. Extremely good.
208 Creer, Joseph.—Brooms, made from Millet.
210 French, John, and Son.—Samples of Colonial Tweed, with the Wool in its various stages.
214 Reid, J. C.—For Exhibition of Colonial Mats and Matting.

HONOURABLE MENTION.—TASMANIA.

514 & 522 Aldred, Wm., Hobart Town.—Wigs, Scalps, &c.
675 Prescott, Miss.—Wool Work. This is very good for so young a child.

MEDALS.—NEW ZEALAND.

73 Scott, John, Invercargill.—For excellence in the Manufacture of Twines.
— Webb, Joseph, Nelson.—For Colonial Tweeds.

ORNAMENTAL WORK IN RELIEF OR ROUND, WHETHER CARVED, MOULDED, OR CAST.

Class V.—Section 16.

PROFESSOR WILSON, CHAIRMAN.

E. L. BATEMAN, ESQ.	W. W. WARDELL, ESQ.
E. L. MONTEFIORE, ESQ.	A. TULK, ESQ.
C. SUMMERS, ESQ.	F. WILKINSON, ESQ.

THE Jury met for the first time, pursuant to notice, on the 7th of January, and proceeded to elect a chairman, when Professor Wilson was chosen for that office.

Discussion having arisen as to the limits within which the inquiries of the Jury should be confined, it was decided, in addition to the fine arts, usually so-called—viz., painting, sculpture, and architecture—to include also the application of art for ornamental and decorative purposes, and also the processes for the reproduction of works of art—engraving, etching, wood-cutting, and lithography; and it was subsequently decided to include also drawings—both of works of art and objects of natural history—intended for educational purposes.

Sub-committees were appointed to examine and report on the various subdivisions of the section, and the reports of these sub-committees were afterwards considered by the whole Jury, which is accordingly responsible for the awards.

In accordance with the fifteenth clause of the instructions of the Council of Chairmen to the Juries of the Exhibition of 1851, the awards have been made for excellence only, without reference to the localities from which the various articles were sent, "the Exhibition being considered as a whole, and not as consisting of the produce of different" colonies.

The Jury, however, has considered the successful introduction into the colony of any branch of art workmanship as in itself deserving of reward, apart altogether from the originality of the process or the intrinsic excellence of the results.

Following the precedent adopted by the Commissioners of the International Exhibition of 1862, which derives additional weight from the fact that it is a deviation from the course adopted in 1851, the Jury resolved not to make any special awards of medals or honourable mention for painting, drawing, sculpture, and architecture. In order, however, that so important a department of the Exhibition should not be passed over without notice, a special report on the subject is appended.

The smallness of the number of awards, both of medals and of honourable mention, must not be regarded as indicating that the Jury considers the bulk of the works exhibited to be deficient in excellence, but as evidence of the desire of the Jury to enhance the value of the awards made, by restricting them to merit of a high order.

With reference to one of the awards, the Jury considers it right to state that it was the wish of Mr. Montefiore that the medal for etchings should not be awarded to him, but the Jury considered that he ought not to be deprived of the distinction he merited by the fact of his having given his services to the Jury in other matters.

SPECIAL REPORT.

In presenting a report on the works of art, strictly so called, which are collected in the Intercolonial Exhibition, the Jury desires, while noticing as far as possible every work which appears to it deserving of special mention, to avoid as far as possible anything which may be considered an expression of opinion on the relative skill and genius of the artists whose works are there collected. And also, while acknowledging the great additional interest which has been added to the collection by the presence of the pictures belonging to the National Gallery of Victoria, exhibited by H. M. Government, and of several works of English and Foreign artists, exhibited by private owners, considers that it will best discharge its duty by restricting this report to the works of which the authors are at present living in the Australian colonies, or are otherwise intimately connected therewith :—

VICTORIA.

This colony, as might be expected, is largely represented in the Exhibition.

Mr. Buvelot exhibits seven pictures illustrating the landscape scenery of Victoria, of which 154, "September Morning," Richmond Flat ; 155, "Summer Afternoon," Templestowe ; and 158, a slight sketch representing a showery day near Brunswick, may be particularly noticed.

Mr. Chevalier exhibits several large pictures illustrating the mountain and forest scenery of Victoria, and two very beautiful pictures of the lake and mountain scenery of New Zealand, together with a large collection of sketches in water-colours, made during a recent tour in the last-named colony.

Mr. Von Guerard exhibits eight pictures, of which the snowy top of Kosciusko, considered as an accurate topographical portrait, is the most remarkable.

Mr. De Castella exhibits one beautiful little sketch on the Upper Yarra.

Mr. Gritten exhibits several small pictures, of which 117, "Jackson's Creek, Sunbury," may be particularly noticed.

Mr. Thomas Clarke is represented by a view of St. Kilda bathing ship, and a sunset at sea, "The Last Effort."

Mr. T. Wright exhibits two New Zealand landscapes, 139 and 140.

There are but few figure pictures in the Exhibition. Of these, one by Mr. Chester Earles, "At the Foot of the Cross," must be noticed for its feeling and careful execution ; as also a copy from Murillo by Mr. Thomas Clarke.

Mr. Davis exhibits a water-colour drawing of Tasmanian scenery, some portions

of which are powerfully executed; Mr. Cooke, a scene on the Yarra, 206; and Mr. Gill, a series of humourous sketches illustrating colonial life.

Before quitting this department, the Jury desires to express its high commendation of the meritorious exertions of Miss Thomas, a most industrious student of art, who has exhibited many well-executed copies in oil, as well as models in plaster, and an original portrait cameo, excellently carved.

Amongst the miscellaneous drawings from Victoria may be noticed pen-and-ink sketches by Mr. Montefiore and by Mrs. Gray; portraits in coloured crayons by Miss Bath; sketches on toned paper by Mr. Jarrett, and some pastel drawings by Mrs. Thunder; 692, an etching on charred wood, by George Parkinson, also deserves notice, especially the head on the back of the panel.

NEW SOUTH WALES.

Of the works exhibited by this colony, those deserving of especial notice are 245, "View from the North Shore of Port Jackson," a water-colour by Conrad Martens; 251, "The Bush Track," a water-colour by F. C. Terry; some water-colour and pencil drawings by Mrs. Scott; and two water-colours, "Views in the Blue Mountains," by Mrs. Thurston, a lady 84 years old.

NEW ZEALAND.

From New Zealand we have two large, effective water-colour drawings, by Gully.

TASMANIA.

From Tasmania we have sketches of Tasmanian flowers by Mrs. C. Meredith and Miss Blyth, sketches of bluegums by F. Dunnett, and the designs for the Tasmanian *Punch.*

SOUTH AUSTRALIA.

From South Australia there is a book of pen-and-ink sketches by Mr. B. H. Babbage, executed during the Exploring Expedition in 1858.

WESTERN AUSTRALIA.

From Western Australia there is a series of drawings executed in the convict department, exhibited by Mr. E. C. Dean.

SCULPTURE.

Sculpture is not largely represented in the Exhibition. The chief works are the portrait busts by Mr. Summers, and a kneeling figure of a child by Mr. James Gilbert; as also the models and cameo by Miss Thomas, already noticed. Amongst the architectural designs, the jury would speak with special commendation of the drawings for St. Paul's Church, Clunes, by Mr. Thomas Austin.

The following is the List of Awards in this Section:—

Division A.

MEDALS.

I.—In Metal.

— Arch, Samuel—Wrought-iron Bracket of great excellence.
801 Young, John.—Establishing a manufacture of Mediæval Ironwork, creditably executed.

II.—In Stone and Shell.

676 Huxley and Parker.—Carved Mantelpieces, in marble.
680 Kelly, Miss.—Sculptured Cameos, introduced as a manufacture.

III.—In Wood.

784 Kem Wah and Co.—Carved Screen for a Joss-House, and a Carved Picture Frame.
78 Godfrey, Lewis J., New Zealand.—Carved Clock Bracket; also, a Carved Clock-Stand in stone.

IV.—In Plaster or Wax, or Paper.

648 Burgoyne, Mrs.—Wax Flowers of great excellence.
718 Staff, Mrs.—Paper Flowers.
723 Thomas, Miss.—Casts for Educational Purposes.

HONOURABLE MENTION.

IV.—In Plaster or Wax, or Paper.

695 Peck, Emma Maria.—Wax Flowers.
332 Hall, Miss V., and Morgan, Miss E.—Tasmanian Native Flowers, modelled in wax.

V.—Miscellaneous.

— Wilkie, Mrs.—Groups of Seaweed, in Stands carved from Cuttle Fish.
564 Wood, Esther H.—Clock Stand, and other articles in ornamental leather work.

Division B.

ORNAMENTAL WORK IN THE FLAT.

MEDALS.

I.—Stained Glass.

663 Ferguson. Urie and Lyon.—Establishing a Manufacture of Stained Glass, creditably executed.

II.—Illuminated and Ornamental Writing.

— Fergusson and Mitchell.—Illuminated writing, "The Brooke Memorial."
27 Smith, G. F.—Illuminated Writing.

III.—On Linen.

664 Gray, Mrs. C.—Set of Linen D'Oyleys, with Landscapes Etched in Marking-ink.

IV.—Processes of Multiple Production.

37 Guerard, E. Von.—Tinted Lithographs.
38 Chevalier, N.—Successfully Introducing Chromo-Lithography.
— Bartholomew, A.—Lithographed Illustrations of the Zoology and Palæontology of Victoria, exhibited by Professor M'Coy.
712 to 728 Meredith, Mrs. Charles, Tasmania.—Drawings illustrating the Natural History of Tasmania.
248 Montefiore, E. L.—Etchings in Aquafortis.
36 Calvert, S.—Wood Engraving—"A Scene on the Yarra."

MEDALS.—TASMANIA.

550 Feraday, Mrs.—Drawings of Native Flowers.
560 Blyth, Miss.—Drawings of Native Flowers.

HONOURABLE MENTION.—TASMANIA.

526 Burgess, Mrs.—Branch of Mimosa, worked in Wool.

V.—Educational Works.

20 Board of Education (The).—Original Drawings and Casts presented to the Public Schools of Victoria (to be given to the artist).

HONOURABLE MENTION.

II.—Illuminated and Ornamental Writing.

28 Hamel and Ferguson.—Illuminated Writing.
87 Morris, E. R., Beechworth.—Ornamental Writing.

III.—On Linen.

727 Wigmore, Miss.—Specimens of Fern-Work on Linen.

IV.—Processes of Multiple Production.

39 Troedel, C.—Chalk Lithographs.

V.—Educational Works.

— Gibbons, Sydney W.—Drawings illustrative of Natural History.
79 Nayler, Mrs.—Drawings for Educational Purposes.
232 Kennedy, Miss.—Drawings for Educational Purposes.
233 Vieusseux, Madame.—Drawings for Educational Purposes.

PHOTOGRAPHS.

Class V.—Sec. 16 a.

JAMES SMITH, ESQ., CHAIRMAN.

J. KLINGENDER, ESQ. | W. VAZIE SIMONS, ESQ.
JOHN NOONE, ESQ. | E. L. MONTEFIORE, ESQ., J.P.

THE Jurors regret that so large a proportion of the exhibits are "touched," the merit being divided in such cases between the photographer and the artist. Admitting that many of the tinted and coloured photographs are entitled to much commendation, the Jurors are of opinion that the purely untouched specimens should stand first in the order of desert.

In the representation of landscape scenery and of architecture, our photographic artists appear to be particularly successful; a circumstance which is, no doubt, partly attributable to the transparency and purity of the atmosphere, partly to the judicious choice of time and place, and partly to the skilful selection and apt employment of the best materials.

Among the exhibitors of portraits, Messrs. Batchelder and Co. and Messrs. Johnstone and O'Shannessy, of Melbourne, must be singled out for conspicuous mention, on account of their untouched, coloured, and mezzotinto portraits.

In the landscape department, it is a noteworthy fact that some of the choicest specimens are the production of amateurs. Among these, special commendation may be awarded to the forest scenes of Mr. Morton Allport, of Tasmania, and to the views taken by Mr. J. N. Dallimore, on his station. One or two of the former will bear favourable comparison with similar subjects by the best operators in Europe, and are remarkable for perspicuity of detail, purity of tone, and depth of distance.

Of the professional photographers who devote themselves almost exclusively to this branch of the art, Mr. C. Nettleton, of North Melbourne, Mr. Freeman, and Mr. Degotardi, of Sydney, are distinguished by the general excellence of their exhibits.

It may be generally asserted that, both in portraiture and in the representation of natural scenery, the best photographers of Australia keep

abreast of their brethren in Europe, and that the art is cultivated with a degree of zeal and enthusiasm which it is satisfactory to observe and a gratification to record. And this being so, it is the more to be regretted that no effectual steps have been taken to secure a series of first-class photographs of the interior of the Exhibition-building itself, so as to give strangers at a distance a more satisfactory idea of the edifice and its contents.

JAMES SMITH, Reporter.

Subjoined is the List of Awards in this Section:—

MEDALS.—VICTORIA.

76–77 Batchelder and Co., Melbourne.—For Untouched, Coloured, and Mezzotinto Portraits, the exhibits under each head possessing special excellence.
66 Dallimore, J. N.—For good Landscape Photography.
59 Dawson, P., Hamilton.—For Untouched Portraits, life size.
— Gaul, J., Melbourne.—For Untouched Portraits.
56–8 Johnstone and O'Shannessy, Melbourne.—For the same reasons.
52, 74 Nettleton, C., Melbourne.—For general excellence in numerous Views of Local Scenery.
50 Perry, G. W., Melbourne.—For Tinted Portraits. Those which are untouched are too few in number to enable the Jurors to form a proper judgment of the Exhibitor's merits in this respect.
*65 Rider, A., Williamstown.—For Photographic Views.
53–4 Turner, J., Geelong.—For Tinted Portraits, and for Architectural and Landscape Subjects.

MEDALS.—NEW SOUTH WALES.

— Felton, Thos., Sydney.—For Untouched and Tinted Portraits.
239 Degotardi, J., Sydney.
252a Freeman Brothers and Prout, Sydney.
243 Glaister, T. S., Sydney.
236 Hetzer, W., Sydney.
237 Milligan Brothers, Sydney.
} Each for a beautiful collection of views of Sydney and its neighbourhood.

MEDAL.—QUEENSLAND.

— Poochee, Mr., Ipswich.—For a fine Panoramic View of Ipswich.

MEDAL.—SOUTH AUSTRALIA.

— Photographic Company, Adelaide.—For several Views of great merit.

MEDALS.—TASMANIA.

584 Allport, M., Holbrook-place.—For admirable Photographs and Stereograph of Landscape and other Scenery.
677 Bailey, H. H., Hobart Town.—For Album Portraits.
547 Cawston, W., Launceston.—For Architectural and Landscape Views.
571 Clifford, S., Hobart Town.—For Photographic Views.
573 Spurling, S., Hobart Town.—For Portraits of Tasmanian Children.
541–5 Woolley, Charles A.—For Portraits of Aborigines (Medal for Photographer).

MEDAL.—WESTERN AUSTRALIA.

— Phillips, Mr., Perth.—For Panoramic View of Perth, and other Photographs.

Exhibits marked thus * are Catalogued in Fine Arts Gallery.

MEDAL.—NEW ZEALAND.

— Hoby, G.—For Untouched Portraits of Maories.

HONOURABLE MENTION.—VICTORIA.

47 Batchelder, B. P., Sandhurst.—For Photographic Views.
611 Borough of Brunswick (for Artist).—For Photographic Views.
*67 Cornell and Glenny, Melbourne.—For Photographic Views.
*45 Davies and Co., Melbourne.—For Coloured Portraits.
*47 Ellis, T., Melbourne.—For Untouched Portraits.
*49 Goulter, E., Melbourne.—For Mezzotinto Portraits.
36 Hall, A., Wangaratta.—For Photographic Views.
— Hardess, Mr., Melbourne.—For Panoramic View of Hotham.
— Hewitt, C., Melbourne—For Untouched Portraits.
— Joseph, R., Melbourne.—For Photographic Views.
— Macdonald, A., Melbourne.—For Untouched and Mezzotinto Portraits.
— Norton, Charles, Geelong.—For Photographic Views.
— Ormerod, Mr., Queenscliff.—For Photographic Views.
*63, 64 Paterson Brothers, Melbourne.—For Untouched and Coloured Portraits, and Photographic Views.
60, 61 Severn, H. A., Melbourne.—For Stereoscopic and Microscopic Photographs.
643 Tarnagulla, Borough of (for Artist).—For Photographic Views.
*73 Walter, Charles.—For a collection of Aboriginal Portraits, on account of the interest they possess.
*55 Winter, A., Melbourne.—For Untouched Portraits, some of which are very good; others, however, are of unequal merit.

HONOURABLE MENTION.—SOUTH AUSTRALIA.

70 Hall, R., Adelaide.—For Photographic Views.

HONOURABLE MENTION.—NEW SOUTH WALES.

— Nelson and Co., Bathurst.—For Photographic Views.

HONOURABLE MENTION.—NEW ZEALAND.

77 Fletcher, A., Nelson.—For Photographic Views.
90 Kelly, Thomas, New Plymouth.—For Photographic Views.

Exhibits marked thus * are Catalogued in Fine Arts Gallery.

PLATE AND JEWELLERY, WORKING, SET, OR MOUNTED GEMS, IN GOLD AND SILVER, WITH ALL WORK IN GOLD AND SILVER, AND PLATED WARE.

Class V.—Section 17.

J. G. BATES, ESQ., CHAIRMAN.
JOHN DE PASS, ESQ. | REV. J. J. BLEASDALE, D.D.
C. SUMMERS, ESQ.

In submitting our Report we may preface our remarks by saying that in jewellery but little progress appears to have been effected since the last Exhibition, although the demand for colonial-made jewellery has very much increased during the last few years. The designs, if anything, are much inferior, and we cannot express a high opinion of the finish of the work.

The attention of the producers seems to have been directed to cheapness in manufacture, and to the exhibition of as much of the precious metal as possible. This is greatly to be regretted. Neatness, with good taste and excellence of workmanship, has been discarded in favour of the tawdry "Brummagem" style, of which there are unfortunately so many specimens. There are several precious stones the appearance of which has been completely spoiled by the bad judgment displayed in the setting. We deem it our duty, however, to except from the censure implied in this remark a few of the exhibits contained in case No. 738 (Messrs. Kilpatrick and Co.).

In goods manufactured of silver the Jurors can express a most favourable opinion of the exhibits, both as regards design and workmanship, South Australia and Victoria being especially well represented; many of the articles exhibited are admirably conceived, and the modelling of the various figures, animals, and birds manifest a vast improvement on previous efforts. The set of mounted emu eggs, shown in case No. 732 (Mr. George Crisp), are worthy of the utmost commendation.

We would also particularise the specimens of silver work contained in case No. 752 (Messrs. Walsh Brothers); they are chastely and elaborately ornamented, and reflect great credit on their manufacturers.

The gold leaf, as a novel colonial product, is worthy of notice, being in every respect equal to the imported article.

A colonial diamond of fair size, mounted as a brooch, deserves commendation, as the largest yet known to have been cut being undoubtedly the produce of Victorian mines. It is now the property of Mr. Bates, of Swanston-street (not the undersigned).

J. G. BATES, Reporter.

The following extracts from the Report of the Jury on "Work in Precious Metals and Jewellery," published in the records of the last Great Exhibition of London, 1862, convey some instructive information on this most elegant branch of art:—

"Works in this class, by reason of the value and richness of the materials employed, are highly interesting and very attractive. Yet the richness of this industry ought not exclusively to occupy the attention; the beauty of the objects exhibited is due rather to the perfection of their workmanship than to the value of the materials of which they are composed; the merit of the work should occupy attention rather than the dazzling richness of the collections.

"In jewellery, the first work to be noticed is that of the lapidary, upon whose skill in cutting and polishing the stone so much of its beauty depends. The jeweller, by his delicate work, sets the stones so cut to the best advantage, combining, by exquisite workmanship, delicacy and lightness with necessary solidity.

"In goldsmiths' work, gold, silver, and other metals take the first place, and the stone becomes secondary.

"This handicraft has no limits: the workman possessed of good taste, by the help of enamel and precious stones, may produce works the most refined and beautiful of which art is capable.

"To the silversmith's work the same remarks apply. The beauty of the metal employed renders every object attractive, but its merit and value

beyond that of the mere metal depend entirely upon the art bestowed upon its production.

"The art of cameo-cutting was formerly almost exclusively carried on in Rome; but there are now many artists in Paris and London who successfully compete with those of Rome.

"Enamelling admits of the highest art, and is now very generally applied to gold, silver, and copper. Precious stones and pearls can be imitated, and very good specimens of imitation are exhibited."

The following is the List of Awards in this Section:—

MEDALS.—VICTORIA.

732 Crisp, George.—For Emu Egg Ornaments.
733 Edwards, William.—Silver Plate; good workmanship.
734 Evett, William.—Gold Leaf (a new industry).
738 Kilpatrick and Co.—Setting of Diamonds and other Gems.
524 Lange, Charles.—Artificial Teeth.
857 Lear, Mrs. Eliza, St. Arnaud.—Ornamental Hair Work.
858 Lockeyear, S.—Ornamental Hair Work.
740 Mier, Barras.—Artificial Teeth set in platina.
750 Twentyman, G. O.—Seal Engraving.
752 Walsh Brothers.—For design and workmanship.

HONOURABLE MENTION.—VICTORIA.

845 Brache, Elise.—Ornamental Hair Flowers.
650 Cederberg, J. P.—Engraving on Silver Plate.
731 Cramer, Mr.—Silver Watch-case.
850 Gant, H. D.—Ornamental Hair Work.
735 Gaunt, Thomas.—Spectacles; good as a new industry.
741 Newman, Henry.—Gold Chains; good for cheapness of workmanship.
957 Partridge, John.—Improved Semaphore Clock.
742 Powell, John.—Assorted Jewellery.
744 Rettwig, John.—Egg Boiler.
745 Robottom, H.—A Silver Chasing.

Beechworth.

17 Turner and Co.—Gems, cut and set.

MEDALS.—NEW SOUTH WALES.

254 Quist, O. L.—Emu Eggs and Cups; for good workmanship.
255 Veyret and Delarue.—Clock Stand.

MEDAL.—SOUTH AUSTRALIA.

35 Wendt, J. M.—For design and workmanship.

HONOURABLE MENTION.—SOUTH AUSTRALIA.

103 Steiner, H.—Silver Goods.

FURNITURE AND DECORATIONS.

Class V.—Section 18.

WILLIAM LAW, ESQ., CHAIRMAN.

E. L. BATEMAN, ESQ.	J. D. DE LITTLE, ESQ.
D. LIVINGSTONE, ESQ.	J. MOORE, ESQ.
J. H. THWAITES, ESQ.	W. W. WARDELL, ESQ.

F. W. WHITE, ESQ.

Your Jurors, in presenting their List of Awards, have to call your particular attention to a few of the most prominent. The billiard tables by Messrs. Alcock and Co. are worthy of special notice. The Jurors have awarded a medal, and would have given an extra medal for their marked superiority had they been empowered to do so. The inlaid table of New Zealand woods, exhibited by Mr. Brown, is of beautiful design and excellent workmanship. Two cedar loo tables, exhibited by Mr. Heimbockel, are well made, and finished in a superior manner. No. 786 is a side-board by Mr. Peter M'Lean, of great merit for good workmanship and beauty of finish. No. 754 is a gilt console table, by Mr. I. Whitehead, of superior make and design, and well worthy of attention. No. 776 is a drawingroom suite of furniture, by Mr. Charles Effey, and is worthy of particular notice. No. 772—Sofas and chairs, by Mr. John Dellit; they are a new industry, and very suitable for the colony. No. 801—Altar and altar furniture, by Mr. John Young; they are very excellent, and merit reward. In conclusion, your Jurors would beg to state that, with the exceptions mentioned above, the exhibits generally are only of an ordinary class.

WILLIAM LAW, Reporter.

The remarks of the Jurors on Furniture at the Great Exhibition of London in 1862, may be appropriately appended to the present report. They are as follow:—

"The different branches of industry which have for their province household furniture, and the decoration of public and private buildings, are indebted to the fine arts for a great part of their merit.

"It is only by the aid of the fine arts that they can achieve rapid improvement and obtain lasting success. It is true that the decorator and cabinet-maker must not be insensible to the changes of fashion—they cannot resist its demands altogether, however capricious; but he who will strive to moderate its excesses and endeavour to reconcile its transitory exigencies with the external laws of convenience and taste, will soon direct the fashion instead of obeying it, and must finally acquire an undisputed superiority.

"The principles which should guide the manufacturer of household furniture are so very clear that a simple exposition of them is sufficient to secure for them the general assent. Household furniture being destined to satisfy well-known wants, must above all things be useful and comfortable—in a word, must be perfectly adapted to the particular purpose for which each article is intended. It would be next to an absurdity to sacrifice convenience for elegance. The richest carving and gilding would never mak

a bed good if it were so constructed that nobody could sleep in it. It is only when all conditions of utility and convenience have been fully attended to, that the aid of art begins to be called for. But then its task becomes simple. A piece of furniture well adapted to its object is easily adorned, and from its very usefulness derives often an elegance peculiarly its own. It is rare, we may say it is almost impossible, that a very convenient form be not agreeable, for when reason is fully satisfied the eye is generally pleased. Taste is akin to good sense, and one cannot be offended without injuring the other.

"In all the objects exhibited which art has contributed to adorn, it is easy to perceive that invention has little share, and that their principal merit consists purely in an exact imitation of some well-known original. Sometimes strange attempts at novelty have been made by mixing together details belonging to different styles, and thus violating the laws of harmony. Nothing original can be produced by such unworthy combinations; and that there must be always a logical relation between the details and the general design is an old truth, and it is a matter of surprise that it is not more often attended to. The Jury recommend that exhibitors should apply to eminent artists fully apprised of the peculiar conditions of the manufacture of household furniture, and its resources. With their aid it may be expected that their productions will be as remarkable for composition as they are now for finish of details and preciseness of execution."

A glance at the amount paid annually for imported furniture will at once show the extent of the field which is open to colonial enterprise in this useful and important branch of trade :—

Furniture.		Furniture.	
1860	£105,033	1864	£73,701
1861	67,147	1865	37,989
1862	73,188	1866	66,390
1863	93,068		

The following is the List of Awards in this Section :—

MEDALS.—VICTORIA.

757 Alcock and Co.—Billiard Tables and Billiard Table Furniture, all of which are of first-class workmanship.
568 Apperly, H.—Two Gothic Spandrils modelled in Plaster of Paris; for artistic design and execution.
495 Arnold, H.—Myall Pipes.
761 Beauchamp and Rocke.—For large and attractive exhibit of Furniture in Huon Pine.
762 Brown, D.—For beautiful inlaid work.
763 Burmeister, L., Post-office-place.—Roller Chair Sleigh, for Skating Rinks.
767 Champ, Colonel.—Fancy Furniture.
772 Dellitt, J.—Willow Sofas and Chairs; a new industry.
774 Donaldson and Co.—Suite of Furniture.
776 Effey, Charles.—For superior Suite of Furniture in gilt frames, and excellent Upholstery Work.
780 Graham, A.—Inlaid Work Table.
781 Heimbockel, Henry.—Loo Tables of excellent quality.
782 Hird, Joseph.—Metal-jointed Furniture, invented by Exhibitor.
784 Kem Wah and Co.—Carved Screen and Carved Picture Frame.
739 Livingstone, D.—Specimens of the manufacture of Ornamental Work in Cast Metals, &c.; for excellence of design and workmanship.

753 Long and Co.—Cabinet Sewing Machines; for excellence of cabinet work.
859 Lowe, W.—Turnery and Toys.
683 Mackennal and Scurry.—Architectural Decorations in Plaster of Paris; for excellence of design and workmanship.
786 M'Lean, P.—Sideboard; for excellent workmanship.
60 Munzell, H., Sandhurst Court.—Lounging Chair.
788 Paser Brothers.—Billiard Table.
545 Pettit Brothers.—Wicker Work.
790 Roberts and Ford.—For Spiral Turnery.
865 Simons, W. Vazie.—Turnery; excellence of work and skill.
794 Solomon and Co.—Carved Suite of Furniture.
796 Steimle, John.—Suite of Furniture.
754 Whitehead, J.—Gilt Console Table and Glass; for excellent workmanship and design.
801 Young, John.—Altar and Altar Furniture; superior workmanship and design.

Armorial Painting.

81 Stevenson, Thomas, Melbourne.—Specimens of Heraldic Painting; for high finish, accuracy, and beauty of execution.

HONOURABLE MENTION.—VICTORIA.

758 Allen, M. A.—Leather Work.
759 Ashmore, W., and Sons.—Wardrobe.
— Atyeo, Frederick.—Font carved in Omaroo Stone
222 Bencraft, George.—Show Case for Grain, Flour, &c., by J. Seymour.
764 Carr and Sons.—For Window Blind.
770 Crowley, D. M.—Furniture.
851 Gribbon, Mrs. C.—Ornamental Leather Work; for excellence of model ling and arrangement.
783 Holroyd and Ravenscroft.—Reversible Sash and Frame.
860 Lusher, Elizabeth.—Specimens of Potichomonie and Decolcomonie.
686 Mende, C. H.—Figures and Architectural Ornaments in Cast Metals; creditably executed.
787 Neighbour, Mary.—Cheval Screen, embroidered by exhibitor.
44 Reeves, T., Sandhurst.—For a new system of Dovetailing.
744 Rettwig, J.—Turnery.
— Riley, Thomas, Painter and Decorator, Lonsdale-street west.—For the superior manner in which he executed the Decorations of the Exhibition-building.
791 Roberts, R. J.—Chest of Drawers.
825 Sands and M'Dougall.—Show Case, by Lovell.
448 Sargood, King and Sargood.—Show Case, by Nation and Co.
551 Schimmerling, A.—Myall Pipes.
793 Sheppard, J. G.—Embossed Mirror.
797 Sterry, W., and Sons.—Window Blinds.
798 Taylor, J. G.—Book Case.
799 Wastell, W.—Leather Work in alto relievo.
355 Wiegmann, A.—Flower Stand.

MEDAL.—NEW SOUTH WALES.

256 Williams, Charles.—For Graining Woods and Marbles.

HONOURABLE MENTION.—NEW SOUTH WALES.

294 Boyd, J.—White Willows for Basket Making.
596 Collins, Miss.—Pine Table, Fernleaf Top.
— Commissioners N.S.W.—Show Case for displaying Wines.
260 Crownson, A.—For Portable Tent Camp Frames, 1 lb. weight and upwards.
591 Hamilton, W.—Lady's Work Table.
608-614 Hooper, G.—Fancy Cabinet Ware.
178 O'Neill, E. H.—Show Case for Perfumery.

HONOURABLE MENTION.—TASMANIA.

615-618 King, T. F.—Fancy Cabinet Ware.
598-605 Powel, W.—Fancy Cabinet Ware.
465-668 Wignall, W.—White Willows for Basket Making; Waste-paper Basket; Marketing Basket; Clothes Basket.
595 Wood, J.—Writing Desk.
607 Watt, T.—Workbox.

HONOURABLE MENTION.—QUEENSLAND.

31 Tracey, J.—Venetian Blinds.

HONOURABLE MENTION.—WESTERN AUSTRALIA.

156 Central Committee, Perth.—Inlaid Table.

HONOURABLE MENTION.—NEW ZEALAND.

84 Taylor, H.—Lady's Work Table.

PRINTING, STATIONERY, BOOKBINDING.

Class V.—Section 19.

A. TULK, ESQ., CHAIRMAN.

R. G. DAVIES, ESQ., M.P.	J. FERRES, ESQ.
HUGH GEORGE, ESQ.	GEORGE ROBERTSON, ESQ.

The various provinces of Australia, with the neighbouring and friendly islands of New Caledonia, New Zealand, and Tasmania, have each of them distinguished itself in one or more of the different forms which Section 19, Class V., embraces. Considering the great benefit which the art of printing has bestowed upon Europe, America, and even on Asia, it would indeed be extraordinary if its use had not developed similar results in Australia, the last and not the least vigorous offshoot of European civilisation.

Four centuries have passed away since the invention of printing with moveable types was first discovered by some German or Dutch block printer.

At that time Australia had not been named, for it was discovered in 1567, and only settled in 1788. But since its settlement the printing-press has diffused over the continent and its adjacent isles such an intellectual and moral light among the offspring of the first colonists, that they now surpass their parents in intelligence, and even in some respects rival in progressive development the present existing children of their mother Europe.

When Mr. Fawkner, the patriarch of the Victorian Press, first established his *Port Phillip Advertiser*, it bore but a faint resemblance to the newspapers of the present day, yet it certainly performed its duty well; and to the energy of Mr. Fawkner the Press of Victoria and Australia generally is, and ever will remain, deeply indebted. A comparative examination of Mr. Fawkner's original press, No. 1043, in this Exhibition, with

the one at work in the machinery department (No. 883, Class VI., Victoria), exhibited by Messrs. Clarson and Massina, and the inspection of the still more perfect and expeditious Hoe's American machine, used at the *Argus* printing-office, will completely display the advance made in thirty years in this branch of applied science.

The newspapers of Victoria, New South Wales, Queensland, New Zealand, New Caledonia, and Tasmania, in the separate sections of the Exhibition, present the best form of customary printing for 1867. They are printed with good type, good ink, and well set up; their columns are filled with solid information with regard to the history of their town or country, and they are deserving of the highest eulogium.

The Jurors for this Section therefore unanimously request that these newspapers be collected, bound, and presented to the Melbourne Public Library, where they may be preserved as permanent memorials of the state of the art of printing for 1867, and as documents for futurity of the general intelligence of Australia.

In the perquisition of the throng of products which the art of printing offers for investigation and examination, the exhibits of Messrs. Blundell and Ford, No. 806, may be mentioned as yielding a pre-eminent variety of excellence in book, tabular, plain, general, and ornamental printing; and the comparison of *The Oxford Ratcliffe Observatory Observations of the Stars*, with the *Star Lists of the Melbourne Observatory*, printed by them, fully confirmed the opinion of the Jurors as to the justice of their award.

The merits of Mr. William Calvert, No. 809, in printing in colours by the type press, block printing, wood engraving, and electrotyping, required the greatest attention and consideration, as being no more than what was justly due to one who had really advanced the art which he cultivates, not by the assistance of others, but entirely through his own energy and natural talent, and with whom no other firm can be said to compete, either in finish, taste, or number of exhibits.

Mr. William Calvert having also introduced into Victoria a novel process, No. 808, the casting of moulds for stereotyping, and his engravings on wood displaying both art and skill, deserves for them the greatest commendation.

The province of Queensland, the colony the youngest and the most distant from European civilisation, has in one object no rival, and need fear none for many a year to come. Mr. Sylvester Diggles (No. 33) of Brisbane, exhibits an illustrated serial on *The Ornithology of Australia*, admirably lithographed, coloured, and printed; and the elder colonies may well blush at their not having furnished any work on the natural history of Australia which may be compared with this meritorious production of Mr. Diggles.

Those most useful necessaries of a mercantile community, account books, require such precision in the binding and printing on paper of first-rate quality, together with the most methodical arrangement, that the art of preparing perfect specimens of mercantile books is most difficult, and rarely attained to. Messrs. Sands and M'Dougall's books (No. 825) have been tested by minute examination, and have been found supereminent in every one of the points required. Ornamental and good plain bookbinding are rarely united in one firm; they are not even commonly found together in Paris or London, and the Hayday of either city is the result of the practice of the art during many generations, supported by the patronage of bibliomaniacs of boundless

wealth. Mr. Detmold, No. 812, after contending with every difficulty, climate being not one of the least, displays so much real excellence in his ornamental binding, and stern simplicity with good taste in his plain binding, that to bestow praise upon his workmanship is perfectly unnecessary, for it corresponds in every respect with the requirements and taste of present Melbourne.

The *Comparative Grammar of the Australian Languages*, compiled by the Rev. W. Ridley, of New South Wales, No. 265[b], is one of that class of works desired by the Commissioners as a complement to the glossaries collected under their own superintendence, and at their own instigation. By the publication of this valuable work, for which a medal has been unanimously awarded by the jurors, the author has proved that there is one learned grammarian in Australia who is determined to attempt a scientific classification of the expiring languages of the natives of this continent, and to bring them into connection with the languages of those more civilised races who are apparently destined to exist for a longer period of time.

Each colony has in its department some objects of great interest which have been duly honoured when passed in review by the Jurors; but New South Wales has alone had, up to the present moment, a type foundry conducted by Mr. Archibald Wright, of Sydney, manufacturing type (No. 267) equal to the best imported, rivalling the European foundries in sharpness, neatness, and delicacy of impression, and even competing in cheapness with the products of the first workshops of the world.

AUGUSTUS TULK, REPORTER.

The extent of the above group of trades may be judged by the following Customs return; and it is to be hoped that many of the branches embraced therein may be more extensively carried on in the colonies, and the necessity for imports proportionately diminished:—

Stationery.		Stationery.	
1860	£213,218	1864	£244,916
1861	158,603	1865	205,300
1862	164,022	1866	187,028
1863	221,696		

The following is the List of Awards in this Section:—

PRINTING AND ENGRAVING.

MEDALS.—VICTORIA—MELBOURNE DEPARTMENT.

694 Pearson, J. W., and Co., 67 Collins-st.—Mercantile and Heraldic Engraving and Embossing.

PRINTING.

MEDALS.—VICTORIA.

806 Blundell and Ford, 51 and 53 Flinders-lane West.—Book, Tabular, Plain, General, and Ornamental Printing.

807 Boyd, Charles, Church-st., Ballarat.—Samples of Printing, &c.; Block Engravings.

809 Calvert, William, 83 Collins-st. East.—Printing in Colours by the Type Press, Block Printing, Wood Engraving, Electrotyping, &c.

810 Clarson, Massina, and Co., 72 Little Collins-st.—General Book Printing.

828 Troedel, Charles, Swanston-st.—Show Cards, Labels, &c.

HONOURABLE MENTION.—VICTORIA—MELBOURNE DEPARTMENT.

802 Abbott, Robert M.—Letter-press Printing in Colours; Broadside Printing.
822 Heath and Cordell, Geelong.—Printing and Job Printing.
743 Purton, E., 106 Elizabeth-st.—Die Sinking and Engraving.
— Wi'son and Mackinnon, *Argus* Printing Office.—*Turf Register.*

MEDAL.—TASMANIA.

623-25 Barnard, James, Government Printer.—General Printing and Binding.

HONOURABLE MENTION.—TASMANIA.

627 Davies, J., *Mercury* Office.—Printing.
626 Just, T. C.—*Salmoniana.*

MEDAL.—QUEENSLAND.

33 Diggles, Sylvester, Brisbane.—*The Ornithology of Australia.*

BOOKBINDING.

MEDAL.—VICTORIA—MELBOURNE DEPARTMENT.

Account Books.

825 Sands and M'Dougall, Collins-st. West.

MEDAL.—SANDHURST DEPARTMENT.

63 Robshaw, J. K., Sandhurst.

HONOURABLE MENTION.—VICTORIA.

812 Detmold, William, Collins-st.
819 Mercer, George, Geelong.
820 Mollross and Melvin, Binders.—Varnish and Binding.

BOOKBINDING—GENERAL.

MEDAL.—VICTORIA—MELBOURNE DEPARTMENT.

812 Detmold, William, Collins-st.—General Bookbinding.

BOOKBINDING AND PRINTING.

MEDALS.—NEW SOUTH WALES.

265*a* Richards, Thomas, Government Printer.—Binding and Printing.
265*b* Ridley, Rev. W., M.A.—*Grammar of the Australian Languages.*
263*b* Sheriff and Downing.—*Sydney University Calendar.*

MEDALS.—TASMANIA.

738 Abbott, John.—*Book of Scraps.*
579 Button, H., Launceston.—Stereotyping.
727 Hood and Manley.—*Tasmanian Punch.*
586 Jarman, Richard, Hobart Town.—Engraving.
729 Walch and Sons, Hobart Town.—Binding.

PRINTING MATERIALS.

MEDALS.—VICTORIA—MELBOURNE DEPARTMENT.

818 Calvert, William, 83 Collins-st. East.—Electrotypes for Printing Purposes.
892 Franklyn, F. B.—Colonial Printing Materials.

MEDAL.—NEW SOUTH WALES.

267 Wright, Archibald, Australian Type Foundry.—Type Founding.

STATIONERY, LEATHER CASES, &c.

MEDALS.—VICTORIA—MELBOURNE DEPARTMENT.

— Brown, Francis, Footscray.—Parchment, as a novel industry.
829 Turner, Joseph, 48 Queen-st.—Despatch Boxes, Pocket Books, Leather Goods, &c.
833 Wickes, Thomas Butler, 3 Little Collins-st.—Tracing and Carbonised Paper.

CIVIL ENGINEERING MODELS, MAPS, PLANS, CHARTS, AND SECTIONS.

Class V.—Sections 20 and 21.

H. O. CHRISTOPHERSON, ESQ., CHAIRMAN.
W. ELSDON, ESQ. | JAMES HARRISON, ESQ.
W. H. STEEL, ESQ.

The exhibits comprised in these sections, and especially the models, are few in number.

It is a matter of surprise that in a colony like Victoria, where the rapid opening up or improvement of internal communication renders the erection of so many bridges necessary, that so few models or drawings of such engineering tools are exhibited; and also in a community where mining is such a prominent part of the occupation of the people, that there is but one exhibit of the plan and sections of a gold mine.

The Jurors, after careful examination, beg to make the following remarks on the exhibits:—

Messrs. De Gruchy and Leigh exhibit a Collection of Maps of the various Australian Colonies, which are very creditable, and illustrate the progress and style of such colonial publications.

A Map of Australia is exhibited by Mr. Fussel, which shows the routes of the various exploring expeditions up to 1866, and possesses considerable interest. The same exhibitor shows a Map of the World, printed in Germany, very neatly executed, and showing the ocean currents and other interesting information.

In the Beechworth Court there is a Collection of School Maps, which, as such, are creditable to the youthful exhibitors.

A Portable Gas Work, suitable for small manufactories, or other places where such light is required to a limited extent, is exhibited by Mr. J. G. Knight, and appears to be well adapted for the purpose.

A raised Map of Victoria, showing the relative heights of the mountain ranges of the colony and adjoining parts of New South Wales, is exhibited by the Survey Department; also, a Map showing the progress of the Geodetic Survey.

H. O. CHRISTOPHERSON, Reporter.

The following is the List of Awards in this Section :—

MEDALS.—VICTORIA.

834 Ainsworth, A. B.—Map of Mining District of Wood's Point and Black River. On account of the completeness of the survey and the creditable manner in which the hill shading has been executed.

12-14 Selwyn, A. R. C.—Maps, showing progress of the Geological Survey of Victoria. On account of the value of the information contained, as also the general excellence of their execution.

842 Smyth, R. Brough.—Map of Victoria, showing mining districts, gold workings, &c. On account of the care taken in its compilation and the neat and distinct manner in which it is finished.

329, 689 Noone, John, Crown Lands Office, Melbourne.—For success in carrying out Osborne's process of Photo-lithographic Maps, Plans, &c., showing the adaptation of that process to their economical and rapid production.

HONOURABLE MENTION.—VICTORIA.

29-35 De Gruchy and Leigh.—Maps of the various Australian Colonies.

— Nicholas, W.—Mining Plans and Sections of the Catherine Reef, Sandhurst. On account of the character of the information afforded.

MEDAL.—TASMANIA.

1-11 Calder, J. E., Surveyor-General, Tasmania.—Collection of Plans of Tasmania, some of which are well executed, and illustrate the general features, internal communication, &c., of that colony.

HONOURABLE MENTION.—TASMANIA.

10 Dunnett, Frank.—Illustrated map of Hobart Town.

MEDAL.—WESTERN AUSTRALIA.

192, &c. Dean, E. C., Fremantle, Western Australia.—Map of the Mining Districts of Western Australia, and other Specimens of Plan Drawing, Shading, &c. For the neatness displayed in the execution of these drawings.

CARRIAGES, &c.

Class VI.—Section 22 a.

HON. ALEXANDER FRASER, CHAIRMAN.
HON. THOMAS LOADER. | B. LEE, ESQ.
R. ASHLEY, ESQ. | J. H. BURTON, ESQ.
W. WILLIAMS, ESQ.

The Jurors have much pleasure in stating, after a minute examination of the various kinds of vehicles, in the presence and with the explanations of the exhibitors and manufacturers of the same, that for design, workmanship, materials, and usefulness, they are well worthy of the highest commendation; and that the manufactures of the carriage-builders in this colony would do credit to any city in Europe or America.

One of the most remarkable features in the display of carriages is the great variety of design—particularly in the higher class of vehicles, as also in travelling carriages, buggies, and indeed even in the street car.

In our judgment the carriages are well suited to the requirements of this country, from their light construction and usefulness.

We are well aware of the difficulties the coach-builders have had to contend with in their manufactures, arising principally from the great want of skilled labour and proper materials—disadvantages which older countries have long since overcome.

We likewise have to express our approval of the creditable manner in which carriage springs and wheels are manufactured, and the superior excellence of the bent timber.

The principle on which your Jurors acted was to award a medal or honourable mention to any carriage or carriages, or any other article submitted to them, which they thought worthy of such distinctions.

But they must beg that it may be fully understood that, in making their awards, they do not intend in any way to mark the comparative merits of the carriages of different makers, or that their inspection and examination is to be looked upon in any way as recognising competition.

To whom medals or honourable mention have been awarded, the following are worthy of the highest mark of merit the Jurors may have at their disposal.

ALEXANDER FRASER, CHAIRMAN.

The Customs returns quoted below show a gratifying reduction in the imports of carriages, &c., and in proportion as improvements are effected in the manufacture of colonial carriages, the figures herewith given will diminish year by year :—

ARTICLE.	1860.	1861.	1862.	1863.	1864.	1865.	1866.
	£	£	£	£	£	£	£
Carriages }	54,738	42,571	31,674	49,648	34,725	27,828	15,695
Carts }							8,131
Carriage and Cart Materials	22,827	27,754	32,006	20,423	26,117	25,041	19,239

The following is the List of Awards in this Section :—

MEDALS.—VICTORIA.

884 Crutch, William, Latrobe-street.—Circular-front Brougham.
886 Cutter and Lever, Ballarat.—Concord Buggy.
1032 Dodson, G. E.—Novel Invention in a Cranked Axle.
895 Hackett, John, Fitzroy.—Patent Street Cab.
906 M'Gregor and Agnew, 245 Swanston-street.—Waggonette.
908 Millar, Robert, Latrobe-street.—Waggonette.
888 Miller Bros., 80 Lonsdale-st.—Sociable Barouche and Albert Park Phaeton.
913 Parrott, F., Market-square, Geelong.—Albert Park Phaeton.
927 Stevenson and Elliot, 177, 179, and 181 King-street.—Barouche on under and C springs, Sociable Barouche, and Sutton Waggonette.
930 Victoria Carriage Company, Collins-street.—Cab Phaeton.

SPRINGS.

349 Parrot, F., Geelong.—Elliptical Springs.
1050 Stoneman, E., Stephen-street, Richmond.—Springs.
1051 Stoneman, H., Stephen-street, Richmond.—Springs.

BENT TIMBER.

544 Perry, John, Melbourne.—Bent Timber, various forms.

HONOURABLE MENTION.—VICTORIA.

880 Carpenter, William, Geelong.—Sociable Barouche.
886 Cutter and Lever, Ballarat.—Light Mail Phaeton, Waggonette, and Trotting Buggy.
890 Elliott, Andrew, Collingwood.—Albert Street Car.
— Houghton, W. G., Richmond.—Perambulators.
914 Proctor, William, Ballarat.—Ascot Car.
61*a* Schwab, N.—Patent for Disconnecting Shafts from Buggy.
920 Stevenson and Elliot, King-street.—Brougham.
928 Stewart, John, King-street.—Spring Dray.
1052 Thomas, L., St. Arnaud.—Carriage Wheels.
930 Victoria Carriage Company, Collins-street.—Cross Lock Buggy.

MOTIVE MACHINERY, MINING MACHINERY, AND IMPLEMENTS.

Class VI.—Sections 22 and 23.

ROBERT ADAMS, ESQ., C.E., CHAIRMAN.

F. C. CHRISTY, ESQ., C.E.	T. E. JONES, ESQ. C.E.
R. B. SMYTH, ESQ., F.G.S.L.	R. W. NEWMAN, ESQ., C.E.
H. A. THOMPSON, ESQ., C.E.	JAS. HARRISON, ESQ.

THE exhibits in these sections are somewhat varied and interesting; they are not, however, so extensive as to satisfactorily illustrate the march of improvement in mechanical skill and in local enterprise by which the period between the last Exhibition and the present has been characterised. It is especially to be regretted that the machinery now used in the various processes of extracting and saving gold obtained from quartz reefs, and of securing the gold raised from alluvial workings, has not been thought worthy of fuller recognition by those who make it their business to produce such machinery.

To properly represent the interests referred to would necessarily require a large expenditure. Persons anxious to exhibit machinery of this kind have probably been deterred by the large outlay required, while unable to see a corresponding advantage to themselves. Whatever the causes may have been, it is certain that machinery for mining purposes does not occupy that prominent position in this Exhibition which the importance of that interest, and the vast extent of mining machinery used in the Australian colonies, would have led the public to expect. It is also to be regarded as a singular fact that, in the mechanical exhibits generally, there is but little remarkable in workmanship, and that but few ingenious inventions or novel features are introduced.

For convenience of reference, and at some considerable trouble, the exhibits in these sections will be found to have been classed under distinct heads, as follows :—

WATER ENGINES.

There are several descriptions of water engines shown. Many have much appearance of ingenuity, but none prove that water can generally be beneficially used as a substitute for steam as a motive power. At the present cost of water, as supplied from the Yan Yean Reservoir, it would be impossible, with any water engine that has been shown in this Exhibition, to perform the same extent of work for the same amount of money as by an engine worked by steam power. The economic value of the water engines produced is therefore not apparent. It is true that water engines possess this advantage, that where small power is demanded, or where the power is required at constantly-recurring intervals, they can be at any time placed in immediate action, and can also be worked with little supervision. Of the water engines exhibited, the disc engine is considered the best example of the application of water as a motive power; this appears to be the most free from objectionable features. Of the reciprocating engines some have merit, but in none is the shock caused by the change of column obviated when the engines are driven at a high rate of speed. There is one shown by Mr. Lowe which is said to be capable of 300 revolutions per minute; the machine, however, is imperfect, and the secret of its action is withheld by the exhibitor. In rotary engines, the difference of speed in the working surfaces produces unequal wear; in the examples shown for competition this difficulty is not overcome. The well-grounded objection heretofore, and properly, brought against rotary engines—that the pressure is brought only against one-half of the spindle—is not removed; and the rectangular packing which still remains proves to be a difficulty which has never yet been surmounted.

A disc water engine is shown by Mr. A. Wordsworth; this works a printing machine in a satisfactory manner, and is a useful engine. There is nothing new in the engine, nor does it contain any feature which demands special remark. It may, however, be referred to as an engine practically applied to a beneficial purpose, and very simple in its action; the engine does its work well, and is worthy of a medal, on the grounds of simplicity, and of illustrating the practical application of water engines.

Messrs. E. Henderson and Co. exhibit models of a turbine wheel and of a centrifugal pump. They do not claim to have produced anything positively new in principle. The articles shown are, however, excellently-made models. They also distinctly, and in a popular manner, illustrate in a small compass the mode in which the turbine operates, and the power of a centrifugal pump. As models (the turbine especially) they are worthy of particular reference. The interesting exhibit of Messrs. E. Henderson and Co. is entitled to a medal for its practical illustration of the action of the turbine, for the correctness of the adaptation of the principle, and for the excellence of the model.

SEWING MACHINES.

The exhibits under this head are excellent. To compare one machine with another would be an invidious task. The machines also being imported (except, in some instances the casings), are possibly beyond the

strict province of inquiry of a Committee of Jurors, unless possessing some remarkable new feature. It appears, however, to be a duty to direct attention to one machine which has unusual merit. The machine referred to is one imported by Messrs. Stanford and Co., and is known as "Singer's button-hole machine." This machine, although imported, has such genuine claims for special remark, that there need be no hesitation in recommending that a medal should be awarded to the exhibitor.

MODELS.

The models, taken as a whole, are creditable; many have considerable merit. To some of these it is recommended that medals should be awarded, and to others honourable mention. The model of a locomotive engine, made and exhibited by Mr. Satchell, is exceedingly good, and to this the Jurors award a medal. The models of propellers, made by Mr. James Nimmo, are of first-class workmanship, and are also worthy of a medal. The model of a locomotive engine, exhibited by Mr. W. Randle, of Sydney, New South Wales, is well executed. It is not stated whether or not the model is of Australian workmanship; it is, however, at least worthy of honourable mention.

PRINTING MACHINES.

These are fair exhibits of the ordinary class of machines. The railway-ticket printing machine, shown by Messrs. Sands and M'Dougall, is very ingeniously contrived, and of excellent workmanship. It seems also to be rapid and efficient in its action. It has just claims to a medal. The printing machine exhibited by Messrs. Clarson, Massina and Co., and in practical work in the Machine-room, contains useful improvements, and is very efficient. This machine is fairly entitled to honourable mention. The press shown by Mr. F. F. Moore, as that used by the Hon. J. P. Fawkner for printing the *Colonist*, the first newspaper published in Melbourne, is remarkable as a curiosity, it being wholly or partly of colonial workmanship, and the means of the first introduction of newspaper printing into Victoria.

QUARTZ-CRUSHING MACHINES, ALLUVIAL GOLD-WASHING MACHINES, AND APPLIANCES.

This industry, as a whole, is not so well represented as might have been desired. The machinery used for mining purposes in Australia is so extensive, and the improvements that of late have been introduced are so valuable, that the exhibits of mining machinery might reasonably have been expected to be large and varied. The model of quartz-crushing machinery in motion, shown by Messrs. Joseph and Co., of Sandhurst, claims commendation, as illustrating the action of stampers. This model is cleverly worked by electro-motive power, a system admirably adapted for showing small machines and working models in motion. The exhibit is well worthy of a medal on the grounds stated.

MACHINERY IN GENERAL, AND APPLIANCES.

This branch contains some excellent exhibits, but, as a whole, is only sparsely represented. The machine for breaking large stone into road metal or railway ballast, by hydraulic action, shown by Mr. Enoch Chambers, is very perfect, and is altogether an admirable contrivance.

There is no room for doubt as to its practical usefulness for the above purposes, as also for reducing gold-bearing quartz. It is entirely novel, so far as the mode of applying the power is concerned, and is a great improvement on machines previously introduced for producing broken stone from spalls and boulders. The machine has been in practical operation, and has been proved to be efficient in its action. It is undoubtedly entitled to a medal. The Hon. Robert Stirling Anderson exhibits a machine for sawing timber. This has much ingenuity, but is not considered to be of practical value in its present form.

Mr. A. K. Smith shows a self-acting apparatus to be used in lifting water from shafts and wells. This is a practical invention, well designed, and worthy of commendation. Mr. W. Wright produces a centrifugal pump, founded on Appold's principle, and containing improvements, in detail, which appear to be of value. Taken as a whole, this exhibit is exceedingly creditable. The pump works with steadiness and efficiency. It has been in continuous operation from the opening of the Exhibition down to the present time; its capabilities have thus been satisfactorily tested, and they have proved successful. This exhibit is worthy of a medal. The machines shown by Mr. O. Bobardt are good and ingenious. The workmanship is not first-class, but sufficiently good for the purposes to which the several appliances are intended to be adapted. As a group of machines, these exhibits are worthy of a medal. Mr. G. S. Millar shows drawings of an apparatus for preventing steam boiler explosions. The plan has much ingenuity and merit; it may prove useful, although the lead plug in the fire-box at present in use performs in another manner the operation of causing the fire to be extinguished when the water falls below a safe level, and is simpler in its action. The apparatus has, however, much merit, and is worthy of special mention. The "Robinson's patent cask-washing machine," and the "portable gas-works for country districts and private dwellings," exhibited by Mr. J. G. Knight, are both of them of good design, and are useful inventions. The cask-washing machine is exceedingly ingenious; the working parts are simple, and not liable to get out of order; the machine altogether appears to have considerable economic value. The portable gas-works apparatus is very compact and complete; the mode of purifying the gas appears to be simple and efficient, and the works are well adapted for their intended purposes. Both of these exhibits are worthy of honourable mention as useful imports. The fog signals of Mr. W. B. Say are good; they are in actual operation on the railways of Victoria, and are found to be efficient. They are entitled to honourable mention, as the only exhibits of this kind produced, and as being practically useful. In the Tasmanian Court a model of a hose reel is shown, for winding and unwinding hose used in extinguishing fires. The model is well made, and the design has considerable merit, as illustrating an improved mode of winding. The exhibit is entitled to honourable mention.

A very interesting machine is exhibited by Mr. William Williams. This, although described as a machine for turning axe-handles, is capable of being applied to a number of useful purposes. A model of the article to be produced is placed in one portion of the machine, and a piece of wood roughly shaped, and of sufficient bulk to enable an article of similar size and shape to be manufactured from it, is introduced into another part of the machine. By an ingenious arrangement of mechanism, the model is strictly copied, and its form reproduced in the rough timber placed in the apparatus. This machine is not new, having been in use in Victoria for

several years; it has merits, however, which entitle it to honourable mention.

The purchase-blocks shown by Mr. John Dickson are examples of fair workmanship. They have no claims to originality, but are entitled to honourable mention.

There are several sausage machines shown. There is a general merit attached to these machines, but that exhibited by Mr. Alexander Lugton is the most perfect, and the best adapted for its purpose, and is worthy of honourable mention.

The exhibit of Messrs. J. and S. Danks, entitled "Pumps and Machinery," is worthy of special remark. The articles shown are well manufactured, and, moreover, are of general utility. The exhibit, as a whole, is entitled to a medal.

Messrs. Bowley and Dean have produced a knitting machine, altogether of colonial manufacture, with the exception of the needles, which latter are of fine and intricate workmanship. The machine is well constructed, and turns out good work. The industry is worthy of support, as being of generally useful application. The exhibit is fairly entitled to a medal.

PORTABLE ENGINES.

The only portable engines exhibited are those shown by Messrs. Wilkie, Welch and Co. The engines referred to provide the bulk of the motive power used in the Exhibition-building. They perform their work thoroughly well, and are worthy of honourable mention.

VICTORIAN RAILWAY DEPARTMENT.

The articles comprised under this head are believed to have been exhibited chiefly to show what can be accomplished by first-class machinery in this colony, and also the machines by which such results can be produced. The workmanship exhibited is of so high a quality as to prove that Victoria possesses the power of converting raw material into the highest class of manufactured goods. Some of the exhibits are exceedingly good. As a whole, the workmanship shown by the Victorian Railway Department is a credit to the Exhibition. The brass castings, rough from the sand, are an excellent production. The universal shaping machine and self-acting lathe, manufactured by Messrs. Joseph Whitworth and Co., are beautifully-constructed machines of their kind, and are useful exhibits, as illustrating the processes of converting metals into machines. The loom for weaving lubricating pads has also considerable excellence, and is of colonial design and workmanship.

REMARKS.

For various reasons, some of the articles exhibited are not individually alluded to in the observations which the Jurors have thought it their duty to make. In some instances, the exhibits are not new in principle; in others they have no special merit. In many cases, exhibits of merit will be found to have been omitted from mention, either because they are not entirely new, because they have been imported, or because they have not been thought to possess sufficient economic value to entitle them to a place in the records of this Exhibition. Medals and honourable

mention have in no cases been awarded to imported goods, except where the articles possessed genuine and undeniable merit.

Finally, it is to be regretted that motive machinery and mining machinery have not been more efficiently represented in the Victorian Exhibition of 1866-7.

The next business is to apply the principles and the recommendations laid down in this report to the particular exhibits which are considered to be entitled to medals or honourable mention.

R. ADAMS, REPORTER.

N.B.—The information contained in the Appendices following was furnished to the Jurors by manufacturers in reference to their exhibits, and is considered of sufficient value for publication:—

APPENDIX No. 1.—PATENT WATER LIFT.

Patent Water Lift, Invented and Manufactured by the Patentee, Alexander Kennedy Smith, C.E., &c., Carlton Foundry, Melbourne.

This invention has for its object a simple and inexpensive mode of raising water from shafts, wells, &c., either for irrigation or drainage, or for the supply of stock, more particularly in remote districts, where the cost of carriage and of repairs form most important items in the cost of machinery for raising water. The arrangement claims the undermentioned advantages over the ordinary pumps now in use:—

1. Being self-acting, it does not require any other attention than a daily visit to oil the working parts.

2. The dispensing with all valves, pumps, and pump-rods, buckets or plungers, door pieces, pipes, &c., also the heavy timber yokes required to support both plunger and draw-lifts, and the expensive gearing required to connect them with the motive power.

3. Compactness. This arrangement of water lift, being so simple in construction, and occupying so small an amount of room, possesses great advantages on this account over the cumbersome connections and staging required for ordinary pumps.

4. The simplicity of its construction admits of very little wear and tear; any portion worn out can be easily replaced without loss of time, every part being easy of access and totally irrespective of the height of water in the well.

5. Its cheapness—its cost being much less than that of a pump capable of raising an equal amount of water from deep wells, &c.

6. "The lift" can be worked by steam, wind, or horse power, and is specially adapted for windmills, as there is no dead point, so that it can be started easily.

It can be adapted to wells or shafts of any depth, and will lift with greater ease and less cost than any other pump from 1000 to 20,000 gallons per hour. The model exhibited lifted at the rate of 6000 gallons per hour, with the belt only about half-an-inch on the fast pulley. Water can be lifted from any depth, the only addition to the expense being the increased length of rope or chain.

APPENDIX No. 2.—SAUSAGE MACHINE.

These machines are manufactured and sold at the imported prices, from £30 upwards. They are superior in every respect to all others. Beginning at the fly wheel: It has two rings shrunk on to each side of the boss to prevent it from flying when high speed is employed. Secondly, the crank shaft is differently made, being of a particular shape. Thirdly, the bolts in connecting rod all screw downwards to prevent them from falling in amongst the meat when in working motion, and causing great damage, the machine going at 300 revolutions per minute. Fourthly, the block is made of Huon pine, a timber of superior qualifications for the purpose; it is always hard and never splits, and therefore requires

no iron hoop, and the block can be raised from top to bottom without affecting the friction roller. There is also a great improvement in the rollers being made of a shape not to hold the dirt; further, the knife carriage and guides, and the two brackets, are all made of wrought-iron, giving ten times the durability of ordinary machines. A. LUGTON.

APPENDIX No. 3.—PURCHASE BLOCKS.

The prices mentioned hereunder were supplied by the exhibitor:—

Pair six tons purchase blocks, double and treble ...	£12	0	0
Pair four tons do. do.	5	5	0
Pair three tons, two trebles	4	10	0
Pair two tons, double and treble	3	15	0
Pair one ton, double and single	2	2	0
Pair two tons, polished, with gun-metal sheaves ...	6	10	0
Pair one ton, polished, with gun-metal sheaves... ...	5	10	0

JOHN DICKSON, Engineer, Footscray.

APPENDIX No. 4.

8th March, 1867.

Dear Sir—In reference to the complaint of Messrs. Clarson, Massina and Co., that "honourable mention" only was awarded to their Printing Machine, I have to state that the Jurors did not consider that the machine possessed sufficient merit to entitle the exhibitors to a medal. The Jurors were of opinion that much credit was due to the exhibitors for the trouble and expense they had incurred in their endeavours to demonstrate to visitors the process of printing. They would willingly have awarded a medal on the grounds of Messrs. Clarson and Massina having gone to the expense of exhibiting printing by power, as instructive to the public; this was, however, considered by them to be beyond their province, and therefore they dealt with the machine simply as an exhibit they were asked to pass judgment on, and, in that view, they considered their award to be substantial justice to the exhibitors.—Yours faithfully,

The Rev. Dr. Bleasdale. R. ADAMS, Chairman Sections 22, 23.

The following is the List of Awards in this Section :—

First or Main Branch of Catalogue.

MEDALS—VICTORIA.

877 Bobardt, O.—Saw-punching Press, complete; Tobacco-cutting Machine; Sole Knives; one Fig Saw; Shears, with Counter Shears, Wedges, and Bolster; Stand, with wrought-iron uprights and cast-iron lasts; Specimens of Planing on Cast Iron.

1028 Bowley and Dean.—Frame Knitting Machines. Deserving of a *medal.*

763 Burmeister, L.—Roller Skates.

881 Chambers, Enoch.—Stonebreaker; Hydraulic Pump. Worthy of a *medal.*

991 Danks, J. and S.—Pumps and Machinery. These are of good workmanship. The industry is a valuable one. The exhibit is of a comprehensive character, embracing a large number of articles.

897 Henderson, Edward, and Co.—Turbine Wheel and Centrifugal Pump.

912 Nimmo, James.—Models of Propellers for Steam Ships. These are admirable models.

919 Sands and M'Dougall.—Railway Ticket Printing Machine. This machine is imported, but from its special excellence is worthy of a *medal.*

920 Satchell, John.—Working Model of Locomotive Engine. The workmanship in this model is good.

926 Stanford and Co.—Singer's Button-hole Machine. Exceedingly ingenious and efficient.

933 Wordsworth, A.—Disc Water Engine.

1026 Wright, W.—Centrifugal Pump, capable of lifting 15 tons of water per minute. This is a creditable production.

HONOURABLE MENTION.—VICTORIA.

883 Clarson and Massina.—Printing Machinery, improved.
1030 Crowther, James.—Scale, Beam, and Cramp. The cramp is well designed and constructed.
887 Dicksor. John.—Pair 6-ton Purchase Blocks; pair 3-ton Purchase Blocks, polished, with gun-metal sheaves; pair 2-ton Purchase Blocks, polished with gun-metal sheaves; two pairs 2-ton Blocks, black, with gun-meta. sheaves.
1040, 1041 Knight, J. G.—"Portable Gas Works for Country Districts and Private Dwellings."
902 Lugton, Alexander.—A Butcher's Sausage and Chopping Machine. This is a good machine, and is worthy of *honourable mention.*
1042 Lugton, Alexander.—A Calf and Lamb Blowing Machine; Tobacco-cutting Machine for hand power. The first of these articles is considered meritorious, as an effort to supersede a disgusting process.
907 Millar, G. S.—Millar's Apparatus for Preventing Steam Boiler Explosions. This is ingenious.
1049 Say, W. B.—Roller Skates and Fog Signals. The fog signals are considered entitled to *honourable mention.*
1014 Selle, C. H.—Machine for making Stearine and other Candles; Hand Frames on improved principles.
923 Smith, Alex. K.—Self-acting Water Lift. This is a useful apparatus.
932 Wilkie, Welch and Co.—Portable Engines, by Clayton, Shuttleworth and Co. (imported).
931 Williams, W.—A Machine for Turning Axe Handles. An imported machine. Very ingenious, and entitled to *honourable mention.*

SANDHURST DIVISION.

70 Joseph and Co.—Silver Models of Machinery and Implements used in Gold Mining. Worked by electro-motive power. This exhibit is worthy of a *medal.*
73 Meyerhoff, Conrad.—Patent Quicksilver Copper Amalgamating Table; Model of Copper Amalgamating Tailings Machine; Model of Patent Quicksilver Puddler's Cradle. The ripple table and the cradle are considered to be of practical value, and worthy of a *medal.*
74 Parry, Daniel.—Stamper Gratings. The workmanship is good. The exhibit is entitled to *honourable mention.*

HONOURABLE MENTION.—NEW SOUTH WALES.

269*a* Randall, William.—Working Model of a Railway Locomotive Engine and Tender.

HONOURABLE MENTION.—TASMANIA.

639 Easther, F.—Self-acting Hose Reel. This is a good model. An improved mode of winding is shown.

CHEMICAL, PHILOSOPHICAL, AND SURGICAL INSTRUMENTS.

Class VI.—Section 23 a.

R. L. J. ELLERY, ESQ., CHAIRMAN.

REV. J. J. BLEASDALE, D.D.	DR. NEILD.
W. H. GOSSAGE, ESQ., F.C.S.	DR. C. E. STRUTT.
DR. W. GILLBEE.	J. D. KIRKLAND, ESQ.

THE exhibits in this Section were comparatively few, and can scarcely be accepted as a fair or adequate criterion of the progress that has been made in, or the present state of, the several branches of arts and manufactures which it embraces. In philosophical apparatus there were but

few exhibitors, and although it is well known that meteorological instruments of great excellence are made both in Melbourne and Sydney, there was not a single exhibit of this class. The absence of specimens of workmanship from Grimoldi of Melbourne, Flavel of Sydney, and others, is much to be regretted, because the instruments by them will bear very favourable comparison, both in workmanship and precision of performance, with those made by the best houses in London and Paris.

Chemical apparatus and instruments were somewhat more fully represented, but principally confined to apparatus for distillation and rectification, prominent amongst which was the admirable still by Nitschke and Co., of Adelaide. There were a few exhibits in surgical instruments and appliances, indicating unmistakably considerable progress and great excellence in this branch of mechanical art. Appended is a brief sketch of the several exhibits in this section for which awards have been made.

PHILOSOPHICAL AND HOROLOGICAL APPARATUS.

An improved regulator for patent lever watch, with compensation adjustment to keep the watch or chronometer going at the same rate in every degree of temperature and in all positions (No. 958, Melbourne), was exhibited by Mr. C. K. Pearson, of Avoca. This is an ingenious contrivance, invented and made by the exhibitor. The regulation is accomplished by means of a small endless screw, on which the winding-key fits; this screw moves the curb of the balance-spring, and will thus allow of a far more precise adjustment than was attainable with the ordinary pointer. The improvement in compensation is also likely to be advantageous. A medal was awarded to Mr. Pearson for these improvements.

A sympathetic clock (No. 957), by Mr. John Partridge.—This was a very neatly-made timepiece, to be worked by galvanic impulses from a normal clock. The armature lever of a small electro-magnet, placed at the back of the clock, works a small ratchet wheel by a cam and detent. The impulses require to be at thirty-second intervals. A medal was awarded for the excellent workmanship in this exhibit.

Two skeleton clocks (Nos. 588 and 589), by Francis Abbott, of Hobart Town.—These were two excellent spring striking clocks, with skeleton frames. They were very well constructed in all parts, and appeared to go very freely. The striking parts were exceedingly well adjusted, and performed with precision. A medal was awarded for design and good workmanship.

Timepiece on a new principle (No. 1036), by Mr. W. T. Griffiths.—This exhibit consisted of a small timepiece, the spring and going parts of which were enclosed in the base of a pedestal which carries the dial. The chief feature in this clock is the mode in which the motion is conveyed from the horizontal wheels in the base to the vertical dial work on the top of the pedestal, which is accomplished by a staff with Hook's joints and bevel gearing top and bottom. This little timepiece kept remarkably good time, and was well constructed. A medal was awarded for ingenuity of construction and good workmanship.

Mr. Henry Elder exhibited several large dial clocks for railway and other purposes. These clocks were constructed from imported works, the dials, pendulums, and cases only having been made by Mr. Elder. For the excellent manner in which these clocks were constructed, and

their adaptability for the purposes for which they were intended, honourable mention was awarded.

No. 735 (Melbourne).—In this exhibit Mr. Gaunt showed a pair of spectacles, the lenses of which are made from Victorian quartz, cut and polished in Melbourne. This is considered by the Jurors to be worthy of note, as the first instance in which quartz lenses have been made in the colony. The lenses, which are clear and free from flaws or striæ, are ground with a very small curvature, and are well polished. Honourable mention was made of this exhibit.

A small model to exemplify his method of correcting ships' compasses for local attraction, was exhibited by Mr. Jonathan Bolton (No. 982). It consists principally in an annular magnet, placed vertically below the compass, to be corrected and adjustable for the distance at which it would neutralise local magnetic influence. It is to be regretted that the practical value of this apparatus could not be tested by the Jurors. For the ingenuity, however, exhibited in this little model, they awarded honourable mention.

A set of wooden models to exemplify an economic mode of constructing electro-magnetic engines, was exhibited by Mr. James Musgrove (No. 911). Honourable mention was awarded for the ingenuity displayed in the construction of these models.

A Planimeter.—A little instrument for obtaining the areas of plans, made and exhibited by Mr. Rasche; it is of the form known as Amsler's, and is very well constructed. Honourable mention was awarded to Mr. Rasche for this instrument.

Mr. W. S. Gibbons exhibited an excellent series of photographs of microscopic preparations (No. 946), for which a medal was awarded.

In a case of surveying instruments, exhibited by the Superintendent of the Geodetic Survey, the jurors noted some excellent workmanship by Mr. B. Greening, of Melbourne, especially in a set of *Camels* and a *referring telescope*, which had been used in the measurement of the Victorian base line; and also a heliostat, somewhat similar in construction to Silberman's, made by Mr. R. Skilton. None of these were exhibited for competition, being the property of the Government; the Jurors, however, awarded medals to both makers, for the very excellent workmanship exhibited in their construction.

Gas-light Reflectors (Nos. 335 and 554).—Of these there were two kinds exhibited—the one by Mr. Andrew Dempster, in which reflection and dispersion were caused by corded or corrugated glass, backed by a white metal or silvered foil; the other by Mr. Samuel Sitch, by somewhat similar glass, backed by a *half-dead white* surface. Both kinds of reflectors were exceedingly good. Mr. Dempster's was the more brilliant of the two; but Mr. Sitch's threw a softer and less glaring light, and although, doubtless, reflecting less of the total light, would be the more adaptable for some requirements. Medals were awarded in both these cases.

Honourable mention was also awarded to Mr. Charles Atkinson for the aquaria which he exhibited.

CHEMICAL APPARATUS.

A chemical balance, by Mr. H. Schreiber (No. 961, Melbourne), was a fine specimen of good workmanship, and although the pattern was somewhat fanciful and elaborate, and in this respect bearing unfavourable com-

parison with the plain yet truly symmetrical forms of the balances of Oertling and others, was nevertheless a good instrument, capable of great nicety of adjustment, and adapted to carry about two pounds, or a kilogram, in each pan. As it was not in good adjustment, the Jurors had no means of judging fairly of its performance, but, from the finish of the knife edges and suspensions, they have no doubt it would be very delicate.

A double filter (No. 506), exhibited by Dr. de Bohn.—This filter consists of two cylinders of copper, the one filled with porous stone, and the other with charcoal or other chemically purifying material. These two cylinders are connected by a short pipe and union. With a moderate head, or pressure, this apparatus filters very rapidly and effectually. It can be easily cleaned by reversing the cylinders end for end, and allowing a good current of water to flow through. This filter was constructed with a special view to clear wine in process of maturing from those minute organisms which, if allowed to remain, give rise to acetous fermentation and other deleterious changes. A medal was awarded to Dr. de Bohn for this ingenious filter.

STILLS.—There were several very excellent stills of colonial manufacture exhibited, principally adapted for distillation of alcohols from wines or grain, and embodying many of the more recent improvements for rectification and methods of regulating the strength of the spirit run off.

First among them was a splendid distilling and rectifying apparatus, by Mr. W. Nitschke, of Adelaide (No. 32, South Australia), which—both as a quick-working, extremely efficient still, and as an excellent specimen of workmanship in copper—certainly claims the first notice in this branch of the section. A medal was awarded to Mr. Nitschke.

A simple rectifying still was exhibited by Messrs. Scott and Co. (No. 962, Melbourne), as a specimen of copper working from the hands of their apprentices. It was of the ordinary form of a plain rectifying still, the retort being heated by a spiral steam pipe inside the jacket. As a sample of work in copper-smithing, it is of the highest excellence. A medal was awarded for the superior workmanship.

A cheap and effective rectifying still (No. 944, Melbourne) was exhibited by G. Forshaw and Co. The Jurors had an opportunity of seeing this in operation, and of testing the spirit produced from a refuse wine, and it rendered a fully-rectified and clean spirit very rapidly. The heating is obtained from a common portable furnace, on which the retort rests. This was exhibited as a sample of an economical and effective form of still, suitable for vignerons; and for the manufacture of so effective an apparatus, at a moderate cost, a medal was awarded to the Messrs. Forshaw.

A very good plain rectifying still (No. 947) was also exhibited by Mr. Arthur Goby, and a medal was awarded for the good workmanship shown in its construction.

A small perfumery still (Beechworth, No. 94) was exhibited by Mr. P. J. Martin, of Beechworth. It is a very convenient and neat apparatus, admirably adapted for experimental extraction of essential oils from flowers, and similar operations. This has been honourably mentioned.

SURGICAL INSTRUMENTS.

No. 951 (Melbourne).—In this exhibit, by Mr. John Jones, the well-known surgical instrument maker of Melbourne, is comprised some

beautiful workmanship in orthopœdic apparatus, trusses, bandages, &c., every specimen of which bore favourable comparison with the work of the best London makers. The trusses especially were remarked to be of the most superior workmanship. The bandage work, too, was by far superior to any other exhibited. There were several obstetric instruments exceedingly well made. A medal was awarded to Mr. Jones for his exhibit.

Mr. Clubb exhibited specimens of bandage and truss work. Honourable mention was awarded for good workmanship.

A case of veterinary surgical apparatus was exhibited by Mr. G. Mitchell, of Queensland, amongst which was a peculiar shoe for use in fracture of the patella.

Honourable mention was made of an improvement in a pessary (No. 73), by Conrad Meyerhoff, of Sandhurst, which consisted in the addition of a ball and socket joint to an ordinary pessary, and which, it was stated, rendered it far more comfortable to the wearer than those constructed in a rigid form.

R. L. J. ELLERY, REPORTER.

The following is the List of Awards in this Section :—

MEDALS.—MELBOURNE.

506 De Bohn, Dr.—For Double Filter for Wines, &c.
335 Dempster, Andrew.—For Reflectors.
944 Forshaw, G., and Co.—In consideration of the manufacture of an effective Rectifying Still for Wine Growers, at the moderate cost specified.
946 Gibbons, Sydney.—For Microscopic Photographs of Physiological, Chemical, and other objects.
947 Goby, Arthur.—For Still ; good workmanship.
— Greening, Benjamin.—For excellent workmanship in Geodetic Survey Apparatus.
1036 Griffiths, W. T.—For ingenious Timepiece on a new principle.
951 Jones, John.—For excellent Trusses, &c.
957 Partridge, John.—For excellent workmanship in Sympathetic or Semaphore Clock.
958 Pearson, C. K.—For ingenuity of improvement and excellent workmanship in Watch Regulator.
961 Schreiber, Henry.—For excellent workmanship in a Chemical Balance.
962 Scott and Co. (apprentices of).—For excellent Coppersmith's Work in a Still.
554 Sitch, Samuel.—For Reflectors.
— Skilton, R. J.—For Heliostat ; excellent workmanship.

MEDAL.—SOUTH AUSTRALIA.

32 Nitschke, W.—For Still ; admirable design and good workmanship.

MEDAL.—TASMANIA.

588, 589 Abbott, Francis.—For two Skeleton Clocks ; excellent workmanship.

HONOURABLE MENTION.—MELBOURNE.

— Atkin, Charles Ager.—For Construction of Aquaria.
982 Bolton, Jonathan.—For ingenuity in his Model Apparatus for Correcting Ships' Compasses.
940 Clubb, Mr.—For good workmanship in Trusses and Bandages.
942 Elder, Henry.—For Adaptation of Imported Clock Material to Colonial Requirements.

735 Gaunt, Thomas.—For a pair of Spectacles, with Australian Pebbles.
911 Musgrave, James.—For ingenuity exhibited in his Models of Electro-magnetic Engines.
— Rasche, W.—For Construction of Planimeter.

HONOURABLE MENTION.—QUEENSLAND.

23 Mitchell, Graham.—For Veterinary Surgical Instruments.

HONOURABLE MENTION.—SANDHURST.

73 Meyerhoff, Conrad.—For ingenious improvement in a Pessary.

HONOURABLE MENTION.—BEECHWORTH.

94 Martin, P. J.—For Perfumery Still; good workmanship.

MUSICAL INSTRUMENTS.

Class VI.—Section 23 b.

C. E. HORSLEY, ESQ., CHAIRMAN.

JOHN D. CATHIE, ESQ. | JOHN RUSSELL, ESQ.
GEO. CHAPMAN, ESQ. | J. SUMMERS, ESQ., MUS. BAC. OXON.
J. W. HINES, ESQ.

THE Jury appointed to examine the exhibits in this Section herewith submit to the Commissioners their report.

At the commencement of their duties the Jurors received directions that it was desired the decisions should be based on the principle of selecting for reward the best and cheapest exhibit, without restriction as to exclusively colonial manufactures being entitled to pre-eminence.

Before giving their awards the Jurors desire shortly to review the history of the construction of musical instruments since the last Victorian Exhibition in 1861, in order that the progress of this article of public utility may be duly recorded.

ORGANS.

Of this class only one specimen is exhibited, showing a decided progress in colonial manufacture, every part being made in Melbourne except the radiating pedals and the ivory keys.

Mr. Fincham, of Bridge-road, Richmond, has exhibited this instrument according to a specification supplied by him, but suggested by Mr. Horsley.

This organ, under the most trying circumstances, has proved an undoubted credit to Mr. Fincham. Subjected to the most severe atmospheric variations, used for the benefit and amusement of the visitors to the Exhibition, it has given the Jurors great satisfaction, especially when they record that the work was commenced and completed within the short space of eight weeks.

PIANOFORTES.

A careful examination of the *Victorian Catalogue* of 1861 shows that only two pianofortes were then exhibited. One pianoforte was made by

Mr. Blazey, and one by Mr. Wilkie, both exhibitors on the present occasion. These exhibitors received certificates of honourable mention in 1861.

Since 1861 Mr. Blazey has continued to manufacture pianofortes, and in the past six years has completed and sold a large number of instruments.

In 1863 Mr. Kilner joined Mr. Wilkie. This firm has expended a large amount of capital in the construction of workshops, engines, and appliances for their manufactory; and the Jurors are informed that since Messrs. Kilner and Wilkie's partnership they have finished and sold 305 pianofortes, employing on an average thirty workmen.

Mr. Weber is comparatively a recent inhabitant of Melbourne. He was, however, some time established in Hobart Town, and there manufactured several pianofortes.

Mr. Anderson, of South Yarra, also exhibits one instrument, which will be duly noticed in the awards.

The result of the Jurors' careful investigation of the pianofortes exhibited and submitted is, that it is at present difficult to manufacture the entire parts of a pianoforte in the colony that shall compete favourably, both in cheapness and durability, with the imported manufacture, in consequence of the absence of divisional labour. As an instance, a portion of the mechanism which costs 9s. 6d. imported cannot be made here for less than £3. In justice, however, to the colonial manufacturers, the jurors think it right to state that, by colonial makers of pianofortes using a few imported articles, they are taking that course which will eventually give the greatest satisfaction to the public.

STRINGED INSTRUMENTS.

In 1861 Mr. Devereux exhibited a case of violins, violas, violoncellos, and double basses, and obtained a certificate. The Jurors have taken practical means of ascertaining the quality of a collection of similar instruments on the present occasion, and congratulate the colonies on possessing so talented a stringed instrument maker, his specimens being admirable in every respect.

There is only one specimen of wind instruments—viz., a flute, manufactured in myallwood by Mr. Wainwright, of Sydney.

Mr. Nicholas, of St. Kilda, exhibits specimen of harmoniums.

In conclusion, the Jurors desire to express their great sense of the assistance they have received from the competitors, and from all the gentlemen connected with the official staff.

CHARLES E. HORSLEY, REPORTER.

By reference to the Customs return given below it will be seen that a very large sum is annually expended on the importation of musical instruments, and considering the skill and enterprise of some of our local manufacturers, we may reasonably look for a diminution of imports in the above branch of trade :—

Instruments (Musical).		Instruments (Musical).	
1860	£38,677	1864	£103,696
1861	30,632	1865	28,522
1862	24,189	1866	29,227
1863	32,734		

The following is the List of Awards in this Section :—

ORGAN.

943 That to Mr. Fincham, Organ Builder, Bridge-road, Richmond, be awarded a *medal* for his Exhibit, No. 943.

PIANOFORTES.

968 That Messrs. Wilkie, Kilner and Co. be awarded a *medal* for the manufacture of the Grand Trichord Pianoforte, No. 1 of the Exhibit No. 968, and for general excellence in the Pianofortes exhibited by them.

936 That Mr. Anderson, Exhibitor and Manufacturer of Pianoforte No. 936, be awarded a Certificate of *honourable mention*.

938 That Mr. Blazey, Exhibitor and Manufacturer of Pianoforte No. 938, be awarded a Certificate of *honourable mention*.

— That Mr. Weber, Manufacturer and Exhibitor of the Check Action Pianoforte, in Rosewood Case, be awarded a certificate of *honourable mention*.

WIND INSTRUMENTS.

270 N. S. Wales. Wainwright, Jordan.—Silver-mounted Flute. *Honourable mention*.

STRINGED INSTRUMENTS.

941 Mr. Devereux, Manufacturer and Exhibitor of Violins, Violas, Violoncellos, and Doublebasses, No. 941, a *medal*.

AGRICULTURAL AND HORTICULTURAL MACHINES AND IMPLEMENTS, AND COOPERAGE.

Class VI.—Section 24.

J. M. MATSON, ESQ., CHAIRMAN.

ROBERT BODDINGTON, ESQ.	J. HOLMES, ESQ.
ABRAHAM LINCOLNE, ESQ.	HON. W. MITCHELL.
HON. W. DEGRAVES.	J. MIDDLEMISS, ESQ.

A. K. SMITH, ESQ.

THE Jurors, in submitting a List of their Awards, have much pleasure in congratulating the designers and manufacturers of agricultural and horticultural machines and implements upon the very superior character and style of their exhibits, as well as the strong and efficient workmanship which was apparent in almost every article shown by them ; and the opinion of the Jurors is unhesitatingly given, that the implement makers of Australia are fully equal to hold their own with the best manufacturing firms or other makers of agricultural implements elsewhere.

The principle which guided the Jurors in awarding a medal or honourable mention to any collection, or single implement, was simply to mark the merits of the article, and in no way is it to be looked upon as a competition between the makers of the different implements exhibited.

In justice to the exhibitors generally, it was considered advisable to request their attendance during the inspection and examination of their exhibits, in order that any matter requiring explanation might be at once made manifest, and its importance investigated by the Jurors.

The Jurors, in awarding either a medal or honourable mention, have remarked upon each exhibit, or collection of exhibits, examined by them in general terms, and expressed their opinion very fully thereon ; and considering that such opinion should be made public, it is herewith appended to this report, with a recommendation from the Jurors that it be published in full for the information of all persons interested in such exhibits, as well as in justice to the exhibitors themselves.

The Jurors, in concluding their Report, would beg to commend the officers connected with the Exhibition, for the attention and courtesy shown at all times when their services were requested, especially when considering the heavy duties imposed in consequence of the small number employed in attendance on the Jurors in the different classes.

J. M. MATSON, Reporter.

By the Customs returns quoted below, it appears that a large sum is yet spent annually in the importation of agricultural implements :—

Agricultural Implements.		Agricultural Implements.	
1860	£40,560	1864	£18,498
1861	48,123	1865	16,331
1862	30,687	1866	28,789
1863	13,412		

The following is the List of Awards in this Section :—

878 *Boddington, Robert.—For improved Silk Flour Dresser. The jurors would specially remark upon the substitution of the trussed hollow iron shaft for the wooden shafts formerly used, and commend this machine for excellence of manufacture and design, its very superior workmanship and practical utility. *Medal.* Price, £65; imported, price, £100.

329 Boedecker and Krueger.—Very good Model of Wine Cask. *Honourable mention.*

1029 Brown, James.—For Butter Churn. Very excellent, practical, and novel invention, fully adapted to the purposes intended. A *medal* awarded.

970 Buncle, John.—For Two and Three-knife Chaffcutters, with movable Steel Mouth-plates, Horse-works, and Twin Maize-Crusher. The whole of these exhibits show a great amount of finish and simplicity in design. Their manufacture is of a superior order, and deserving the highest commendation. The Jurors award a *medal* for the collection. The prices of the implements are as follow, viz.:—Two and Three-knife Chaffcutters, £15 and £27; Horse-works, £20; Twin Maize-Crusher, £25.

988 Collins, G. K.—Jack Screws. For excellence of manufacture and adaptation for the stowage of wool in ships' holds. *Medal.*

1034 Fulton and Shaw.—Wool Press. *Honourable mention* for goodness of manufacture.

514 Gray and Waring.—For Wine Vats, Brewers' Hogsheads, Butter Tubs, Cheese Vats, &c. General excellence of manufacture. *Medal.*

971 Henderson, T., and Co.—For Reaping and Mowing Machine combined, and Winnowing Machine. The Jurors award a *medal* for excellence of manufacture and finish, and also for simplicity of construction and practical utility.

972 Home, J. W.—For Travelling Box Wool Press. The Jurors would specially commend this exhibit as a new and important application in pressing wool through quickly and efficiently. Its design is excellent, the manufacture superior; and for its practical utility and general adaptation a *medal* is awarded.

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* Mr. Boddington and Mr. A. K. Smith, being Jurors, do not compete.

972 Home, J. W.—For simplicity of design, goodness of construction, and also for practical utility and adaptation, *honourable mention* is awarded to the following exhibits, viz.:—Wine Press, Grape Mill, Four-horse Bone Mill.

1040 Knight, J. G.—Patent Cask-washing Machine. For very ingenious and practical invention. A *medal* awarded.

973 Lennon, Hugh.—For two Ploughs. The Jurors highly commend these exhibits for general efficiency, practical utility, and very superior workmanship. A *medal* is awarded.

974 Lugton, Alexander.—For improved Road Scraper. *Honourable mention.*

975 Maplestone, C.—For improved Grape Crusher. The Jurors award a *medal* for this exhibit, and regret that it could not be tested.

530 M'Leod, William, jun.—For Beehives. Goodness and suitable arrangements. *Honourable mention.*

538 Mourant, J. T.—For Wood Taps. Excellence of manufacture and practical utility. *Medal.*

541 Oat, W. B.—For Beehive.—Goodness of arrangement. *Honourable mention.*

1046 Pratt, A.—*Honourable mention* for Butter Churns and Wash Boards. Goodness of workmanship and practical utility.

548 Reaney and Roberts.—For Corking Stools, Bottling Machines, &c. *Honourable mention.*

917 Robinson, J., and Co.—Exhibit of large collection of Agricultural Implements, consisting of the following articles, viz.:—Wine Press, Grape Mill, Self-regulating Wind Engine, Water Bucket, Wool Press, Seed Drill, Cultivator with Seed Drill combined, Earth Scoops, Wood Ploughs, Trench Plough, Smut Machine, Stripping Machine, Mowing Machine, Threshing Machine, &c., &c. The Jurors award *medals* to the Wind Engine and Stripper, and *honourable mention* to Thresher and Smut Machines. The general character of the whole of the exhibits is very good. The following are the prices of some of the exhibits, viz.:—Wine Press, £23 10s.; Grape Mill, £7 10s.; Wind Engine, £80; Wool Press, £60; Seed Drill, £34 to £40; Smut Machine, £27 10s.; Stripping Machine, £70; Mowing Machine, £22 10s.; Threshing Machine, £55; with horse power, £60—threshing and cleaning 400 bushels per day.

976 Seeling, H.—Horse-hoe Machine and Wire Strainer. *Honourable mention.*

923 *Smith, A. K.—For Water-hoist, wind or steam power. A *medal* is awarded to this self-acting machine for efficiency, simplicity, and cheapness of construction. It combines the following important arrangements, viz.:—The dispensing with all valves, pumps, &c., &c., and the expensive gearing required to connect them with motive power. Its compactness. Its construction admits of very little wear or tear. Is specially adapted for windmills, and can be worked by steam, wind, or horse power. Will lift from 1000 to 20,000 gallons per hour. Water can be lifted from any depth

928 Stewart, John.—For goodness of quality and manufacture of Spring Dray, which is fitted with spiral springs and traces. *Honourable mention.*

1053 Turnbull, J.—*Honourable mention* for Churns, Trucks, and Carriage Lifts. Goodness of workmanship and moderate price.

Victoria—Supplementary.

— Kerr, J. Hunter.—Model of Drafting Yards for Sheep. *Honourable mention* is awarded to this exhibit.

SANDHURST DIVISION.

75 Edwards, James, Marong.—Waggon; strong, and well built; adaptation and workmanship very good. *Honourable mention.* Price, £60.

76 Murray, James.—Wheat Separator. For this very excellent and useful implement a *medal* is awarded. Price, £15.

OVENS AND MURRAY DIVISION.

74 Edwards, Henry.—*Honourable mention* for two Casks, native timber (Messmate).

WANGARATTA DIVISION.

35 Docker, F. G.—*Honourable mention* for Cask, native timber (Mountain Ash).

TASMANIAN COURT.

641 Boutcher, A.—Plough. A novel and useful invention, as far as regards the head rack, to which the Jurors call attention, and award a *medal*. The manufacture of the plough is highly commended.

642 Boyd, J.—Plough-beam Handles, Keg, and Bucket. *Honourable mention* is awarded to these excellent exhibits for their manufacture and practical utility.

646 Wignall, W.—Bucket (White Myrtle). *Honourable mention.*

647 Wignall, W.—Two Tubs. *Honourable mention.*

Second Supplementary.

732 Home, A. J.—Sheep-washing Machine. Principle good, and *honourable mention* awarded. The Jurors regret not being able to test this machine.

SOUTH AUSTRALIAN COURT.

31 Mellor, J.—The jurors award *honourable mention* for this large collection of Agricultural Implements. A *medal* is awarded for combined Reaping and Threshing Machine, and also for Corn Screens for sampling.

102 Ramsay, J. G.—Combined Reaping and Threshing Machine. A *medal* is awarded to this useful and practical implement.

30 Ramsay, J. G.—*Honourable mention* for collection of Agricultural Implements.

NEW CALEDONIA COURT.

42 Boutan, A.—Agricultural Machines and Implements. The Jurors award a *medal* for this collection of cheap and efficient implements, and would call attention to the simplicity and strength in their construction, as adapted to the nature of the country for which they were manufactured. The Winnowing Machine is *honourably mentioned* as a simple and useful invention, and thoroughly suitable in its adaptation for all required purposes.

SUMMARY OF MEDALS.

VICTORIA.

878 *Boddington, Robert
970 Buncle, John
1029 Brown, James
988 Collins, G. K.
514 Gray and Waring
971 Henderson, T., and Co.
972 Home, J. W.
1040 Knight, J. G.
973 Lennon, Hugh
975 Maplestone, C.
538 Mourant, J. T.
917 Robinson, T., and Co.
964 *Smith, A. K.

SANDHURST DIVISION.

76 Murray, James

TASMANIAN COURT.

641 Boutcher, A.

SOUTH AUSTRALIAN COURT.

31 Mellor, J.
102 Ramsay, J. G.

NEW CALEDONIA.

42 Boutan, A.

SUMMARY OF HONOURABLE MENTION.

VICTORIA.

329 Boedecker and Krueger
1034 Fulton and Shaw
972 Home, J. W.
974 Lugton, Alexander
530 M'Leod, Wm., jun.
541 Oat, W. B.
1046 Pratt, A.
548 Reaney and Roberts
917 Robinson, T., and Co.
928 Stewart, John
976 Seeling, H.
1053 Turnbull, J.

SANDHURST DIVISION.

75 Edwards, James

OVENS AND MURRAY.

74 Edwards, Henry

WANGARATTA DIVISION.

35 Docker, F. G.

TASMANIAN COURT.

642 Boyd, J.
732 Home, A. J.
646 Wignall, W.
647 Wignall, W.

SOUTH AUSTRALIAN COURT.

31 Mellor, J.
30 Ramsay, J. G.

NEW CALEDONIA.

42 Boutan A.

VICTORIA SUPPLEMENTARY.

— Kerr, J. Hunter.

NAVAL ARCHITECTURE, SHIP AND BOAT BUILDING.

Class VI.—Section 25.

CAPTAIN AMSINCK, R.N., CHAIRMAN.

CAPTAIN THE HON. G. W. COLE, R.N.	CAPTAIN J. VOLLUM.
CAPTAIN C. FERGUSON.	GEORGE BIRNIE, ESQ.
CAPTAIN S. PICKEN.	JOHN COSGRAVE, ESQ.

JOHN J. SHILLINGLAW, ESQ.

The exhibits placed under review in this Section of the Intercolonial Exhibition may be divided into four classes—viz., models and half-models of steam and other ships, models of yachts, models of boats for various uses, and miscellaneous models of pleasure boats, buoys and other nautical appliances, among which last class are two exhibits of materials for coating and preserving ships' bottoms.

The Jurors concur in awarding the medal of the Commissioners to Mr. James Edwards, of Prince's-bridge, Melbourne, for his "outrigger boat," built by himself, on the banks of the Yarra, which is extremely creditable to him, both in regard to workmanship and construction.

The Jurors do not find among the other exhibits any which are especially deserving of a similar award. Very many of the models show considerable beauty, both of design and finish; still, the Jurors do not find any new principle of naval architecture involved in them which would justify their awarding the highest honour in their gift. They have also felt some difficulty in forming any real judgment of their respective merits, in consequence of the almost entire absence of particulars in dimensions and scale upon which the models have been constructed.

In the class "steam and other ships," they consider the model of the schooner (No. 1021), exhibited by Mr. Wemyss Thompson, of Williamstown, as deserving honourable mention, for neatness in the workmanship and rig of the vessel; and a similar distinction to Mr. James Ballenger, of 111 Bouverie-street, Carlton, for his model of the s.s. "Aldinga" (No. 980).

In the class "Yachts" (No. 1022), among a good number of exhibits the Jurors desire specially to mention the "Sylph," Donald M'Leod; the "Melbourne," John Cosgrove; the "Nautilus," James Swinbourne; the "Young Harry," J. J. Andrews; and the "Foaming Billow," R. B. Coombes, to whom they award honourable mention. When vessels of a large size are built in these waters, the Jury trust to see some of these models followed.

A "lifeboat" (No. 32), exhibited by Messrs. W. and G. White, of Williamstown, is on the principle invented many years since by Messrs. White, the well-known boat-builders of Cowes, in the Isle of Wight, and which obtained some favourable mention by the Duke of Northumberland's Lifeboat Committee in 1851. This lifeboat being of a useful character, and likely to prove beneficial in the colonial trade, the Jurors award the builders honourable mention.

There is also exhibited, by Mr. A. Wells, of Sandhurst, a model (No. 58), which, although small, appears to possess some of the qualities of a lifeboat.

In the miscellaneous class is a model (No. 986) of the midship section of the "Salamander," exhibited by Messrs. Bright Brothers. This ship (when known as the "Kate Hooper") was burnt to the water's edge in Hobson's Bay, and subsequently was entirely rebuilt, rigged, and sent to sea, with an auxiliary screw and steam machinery, as strongly and well finished as any ship could be from any port in the world. The dimensions of the vessel will be of considerable interest, and are as follows:—Length, 202 ft. 8 in.; beam, 38 ft. 9 in.; depth, 20 ft. 7in.; tonnage, 905; steam tonnage, 776; 2 engines, horse power, 60; cylinders, 24 in.; high pressure, 56 lbs.; diameter of cylinders, 15 in.; the ship being reconstructed and the machinery manufactured in the colony. The owners and builders are deserving of the highest credit and honourable mention.

In this section will also be found a pretty and well-executed model (No. 958) of a shallop (Mr. W. Greenland, Punt-road, Richmond), which deserves honourable mention. Two well-finished models, one of a life-boat and the other of a surfboat, are shown in the Western Australian Court, and attention is drawn to them by the Commissioners of that Court as proving the adaptability of the woods of that colony to boat-building.

The half-models of vessels and yachts, exhibited by Heath and Jackson, of Geelong (No. 1001), and W. Gordon, of Emerald Hill (No. 1021), are deserving honourable mention.

W. H. Firmin (No. 995), for life-buoy and belts.—The Jurors consider that in consequence of the manufacture of these articles in the colony, so as to compete with those imported both from England and America, they deserve honourable mention.

Since the above report was drawn some anti-corrosive material (No. 499) for the protection of ships' bottoms, has been remitted to this Jury; and after careful inquiry on the subject, the Jury award a medal to the exhibitor, Mr. Alexander Borthwick, of 36 Market-street, Melbourne, for his "patent anti-fouling composition," and for his untiring perseverance in using every endeavour to improve the material: as yet no entirely efficient solution having been discovered for the purpose.

Of Messrs. Charlsworth and Sharp's "improved patent composition for the prevention of fouling of ships' bottoms" (No. 504) there has not been a sufficient lapse of time to prove its efficacy, and the Jury cannot therefore give an opinion on its merits.

HENRY AMSINCK, Capt. R.N., Reporter.

The following is the List of Awards in this Section:—

MEDALS.

499 Borthwick, Alexander.—Patent Antifouling Composition.
994 Edwards, James.—Outrigger Boat, built by himself.

HONOURABLE MENTION.

— Andrews, J. J.—"Young Harry."
980 Ballenger, James.—Model of s.s. "Aldinga."
986 Bright Brothers, and the Builder.—Enterprise and ability in Rebuilding and Fitting ship "Salamander" in the colony.

— Coombes, R. B.—" Foaming Billow."
— Cosgrove, John.—" Melbourne."
995 Firman, W. H.—Life Buoy.
1021 Gordon, W.—Half-models of Vessels and Yachts.
985 Greenland, W.—Model and Construction of a Shallop.
1001 Heath and Jackson.—Half-models of Vessels and Yachts.
1022 M'Leod, Donald.—" Sylph."
— Swinbourne, James.—" Nautilus."
1021 Thompson, Wemyss.—Workmanship and Rig of Model Schooner.
32 White, W. and G., Williamstown.—Life Boat.

CIVIL ENGINEERING, ARCHITECTURAL, AND BUILDING CONTRIVANCES.

Class VI.—Section 25 a.

ROBERT ADAMS, ESQ., C.E., CHAIRMAN.

F. M. WHITE, ESQ. | HON. W. DEGRAVES.
W. W. WARDELL, ESQ. | PROFESSOR M'COY.

It is a subject of congratulation that the exhibits comprised in this section are, collectively and individually, of considerable excellence. The specimens of building bricks, of fire-bricks, and of drain-pipes exhibited show great care in the selection of earths, and a skill in their manufacture into forms of practical utility, which reflect much credit on those who have devoted their time, intelligence, and capital to the task of working up raw material into articles adapted to the wants of social life. Some of the exhibits have special claims for commendation. The selection of building timbers shown is extremely fine, and will be further referred to in this report. As an introduction to the List of the Awards, it is proposed to offer general remarks on those exhibits which are worthy of medals and of honourable mention, as also on those which are entitled to particular allusion.

For facility of reference, the Jurors propose, so far as can be done conveniently, to divide the exhibits referred to them under two distinct heads. Firstly, General—viz., Bricks, fire-bricks, fire-clay, drain-pipes, earth closets, and contrivances commonly in use in building operations. Secondly, Special—viz., Timber suitable for building purposes.

FIRST—GENERAL.

The bricks shown by Mr. Allison—the first item in the general Catalogue—are first-class exhibits, and are thoroughly worthy of a medal. If capable of being produced at a reasonable price, they will no doubt come extensively into use. The slates from Castlemaine, shown by Mr. Mark Common, are good slates, and are entitled to honourable mention. The slab of slate exhibited by the Borough Council of Dunolly is a good specimen. The small specimen of granite shown by this Council is of very fine quality. The fire-bricks, white facing bricks, and flooring tiles produced by Knight Brothers, are good samples of material generally. The collection of Australian building stones exhibited by Mr. J. G. Knight is a useful

collection of stone suitable for building purposes, and is worthy of honourable mention. The bricks shown by Mr. Mould are a fair sample of bricks, but somewhat porous. The building materials shown by Mr. David C. Rees form a good collection of building material in stone and wood. The ordinary bricks and coping bricks shown by Mr. Henry Spencer are fair samples of bricks, well burnt, but porous. The large flagstone from the Castlemaine Paving Company, shown by Mr. Henry Thorburn, is a splendid exhibit, and worthy of a medal. The exhibit of Messrs. Waugh and Leibouf, of architectural dressings of artificial stone, invented and produced by the exhibitors, is exceedingly good; if such a quality of material and work can be produced at reasonable rates, there is no doubt this manufacture will come into general use. The exhibit is entitled to a medal. The drain pipes of Mr. Marks, of Ballarat, are fair samples of pipes. The collection of timber shown by Mr. Henry Costin is a useful exhibit; the palings and blackwood are good. Mr. Alfred Cornwell shows assorted stoneware; this is exceedingly good and worthy of a medal. The stoneware drain pipes shown by Mr. Thomas Kelly are good, and deserving of honourable mention. Mr. G. P. Steiling's exhibit of building materials is excellent; the fire-bricks and fire-clay are of first-class quality, and deserving of a medal. The reversible sash and frame shown by Messrs. Holroyd and Ravenscroft is an ingeniously-designed contrivance, but is not considered practicable for general use. The door, sashes, frames, and mouldings exhibited by Mr. John Stone are moderately good work, and the prices reasonable. The slate bath shown by Messrs. Chambers and Clutten has merit, and is entitled to honourable mention. It is to be hoped that the prices are such as will admit of these baths being generally used. Messrs. Irving, Glover and Co. exhibit models of vertical and horizontal sliding shutters of their invention and manufacture. This is a good exhibit, but no prices are given to enable their economic value to be judged; on the whole, however, the exhibit is worthy of a medal. The self-acting earth commodes shown by Messrs. Draper and Sons form a first-class exhibit, worthy of a medal. The iron patent earth closet of Messrs. W. T. M'Gill and Co. is a compact machine, but no price is attached. Mould's patent earth closets, exhibited by the Patent Earth Closet Company, are not of colonial design, but are worthy of a medal, as the first introduction into Victoria of a valuable principle. The deodorising portable tank closet and night commode, exhibited by Mr. George Woodward, are of value, as successfully adding the principle of deodorisation to the mechanical appliances used in earth closets. The method of applying the deodoriser is different from that used in depositing earth in the other closets shown, but the apparatus is not considered by the Jurors to be at present perfect in mechanism. On the ground of the introduction of a new system of preventing inconvenience in the use of closets, it is considered that Mr. Woodward's exhibit is worthy of a medal. The bricks, brick-moulding, &c., shown by Messrs. J. and W. Woolstencroft, are fine specimens, and entitled to honourable mention. The patent shingles of Mr. Ernest Brandt are of good timber, but have been cut green, and have become cast and warped out of shape. The blackwood shown by Messrs. G. F. Walker and Co. is very fine timber, and is worthy of honourable mention. Mr. H. Munzell's model staircase is ingenious, and worthy of honourable mention. The collection of granites from Beechworth, Chiltern, Barnawartha, and Yackandandah, shown by Mr. J. B. Casteau, is fine. The

specimens are exceedingly good, and the exhibit is entitled to honourable mention. Mr. John Stevens shows samples of Beechworth slates; the slate slab is exceedingly good. In the New South Wales Court, specimens of building stones are shown by the colonial architect of that colony; these are deserving of honourable mention. Mr. F. Freeburn exhibits stone from Clarence River Heads. This is shown as the material used in the construction of the breakwater there, and seems well adapted for the purpose. There are samples of fire-bricks shown by Mr. James Manning; these are good samples of fire-bricks, and are entitled to a medal. The block of granite from the Moruya River, shown by Mr. Thomas Walker, is a fair specimen of granite. In the Tasmanian Court, the Seymour fire-clay shown by Mr. A. Howden, and used in laying furnace fire-bricks, is good and useful. Mr. C. Toby, of the Seymour Coal Company, exhibits fire-bricks; these are a fine sample, and worthy of a medal. There is shown by Mr. G. B. B. Elliott, of the River Cam, in the North Quadrangle, a natural curiosity, which he designates a "Park Seat," with certain peculiarities described in the Catalogue. This exhibit is no doubt a somewhat remarkable curiosity. A dark marble, exhibited by Mr. J. Picket, is a good sample of stone; there is no information, however, to show that it can be obtained in quantities and at prices to render it practically useful; this is to be regretted, as the marble is undoubtedly excellent. The white marble and the dark dove marble shown by Messrs. Dalby, of Ilfracombe, are both good, but the samples exhibited are too small to admit of any opinion being formed as to the practical utility of the stone, and the absence of prices adds to the difficulty. The two specimens of Kangaroo Point freestone, shown by Mr. J. Pitfield, known as "white liver rock" and "white rock," are good, and worthy of a medal. Mr. A. M. Nicol exhibits a white silicious sandstone from Cambridge, of excellent quality, and entitled to a medal. The freestone from Hobart Town, shown by Messrs. Birth and Co., and said to be largely used in house-building at Hobart Town, is a fair sample of stone. The freestone produced by the Hon. R. Q. Kermode, of Mona Vale, is a good stone. The freestone from Bothwell, exhibited by Mr. A. M. Nicol, of Hobart Town, is a fine sample of flagging. Mr. Adam Jackson, of Ross, shows a freestone which is of good quality; the ornamental work cut on one of the faces of the stone is sharp and clean; the exhibit is worthy of honourable mention. The road metal, broken to show how it is applied to roads in Tasmania, is a very fine sample of road metal, and is entitled to honourable mention. Mr. W. Wiggins exhibits freestone from Stringybark Hill Quarry, Hobart Town. The stone is of good quality, but the colour is not altogether adapted to the facing of buildings. The New Zealand Court contains samples of draining tiles and of bricks, shown by Mr. C. Meyer, of the Invercargill district; the bricks are a fair sample. The samples of slates shown by Mr. Cook, of Back Creek, and by Mr. William Crago, of Spring Gully, Sandhurst, are worthy of honourable mention.

SECOND—SPECIAL.

Messrs. Bovery and Barnes have produced specimens of Murray pine; this is good, sound-hearted timber, although not large. Of the samples of Ovens timber exhibited by Mr. Joseph Duitchman, the stringybark is good, and the bluegum is a first-class timber. To this exhibit honourable

mention is awarded. Mr. Alvera Slater's collection of Ovens timbers is interesting; the mountain ash is good, and the ironbark exceedingly fine. The exhibit is worthy of honourable mention. The Local Exhibition Committee of Wangaratta produce one slab of stringybark and one slab of white box. The stringybark is a good specimen, and worthy of honourable mention. Mr. J. C. Summers exhibits one slab of redgum, one slab of ironbark, and one slab of Murray pine; the redgum is good timber, and the ironbark very fine; to this exhibit honourable mention is given. The specimens of Murray pine shown by the Rutherglen Borough Council are good, and worthy of honourable mention. In the New Caledonia Court, M. Boutan, director of the model farm of Yahoue, shows samples of woods; these are specimens of sound, handsome timber. The collection of samples of Australian timbers used for building purposes, shown by the Colonial Architect's Department, New South Wales, is extremely interesting, and is entitled to a medal. Mr. John Cuthbert exhibits a box containing samples of thirty varieties of Australian timber, with the descriptions attached. This is an interesting collection of timbers, and is worthy of honourable mention. The specimens of wood shown by Mr. W. Lambert are good examples of timber, but small in size. In the Tasmanian Court, the blackwood plank shown by Mr. Boyd is very fine, and the blackwood shingles are so good as to be worthy of special reference. The blackwood slab produced by Mr. Adye Douglas, of Launceston, is correctly described in the Catalogue as a magnificent slab, and is entitled to honourable mention. The bluegum, figured, exhibited by Mr. Boyd, is an exceedingly fine plank, and a valuable sample of timber. The treenails, flooring boards, baulk, and plank of bluegum shown by Mr. Boyd, are all good; the treenails have considerable merit. Mr. James R. Scott, of Launceston, exhibits three planks of celery-top pine, from Ringarooma. These are clean timber, and free from knots; they are, however, cast by the heat. The same remark applies to the celery-top pine exhibited by Mr. Boyd. The stringybark flooring boards, baulk, and plank shown by the same exhibitor are good, and the shingles of the same timber fair. Mr. Boyd's peppermint plank is a good exhibit, and the peppermint shingles shown by the same gentleman are a fair sample. The gum shingles produced by him are also a fair sample. The ironwood shown by Mr. Boyd is a good sound timber. The whitegum baulk and plank exhibited by Mr. Boyd are splendid specimens of good, sound, useful timber. The laths shown by him are also a good sample. His 6-feet and 5-feet palings are likewise excellent specimens of broad paling. The palings, laths, and shingles exhibited by Messrs. Belbin and Dowdell, New Wharf, are fair specimens of their respective kinds. Mr. Boyd shows samples of railway sleepers, apparently of bluegum, which are exceedingly fine.

In the Western Australian Court, the Central Committee, Perth, show valuable specimens of timber: a pile that has been 25 years in use, a log of whitegum or tuartwood, which is a very fine sample of timber; and a flitch of tuart of very high quality. They also exhibit a section of tuart, which shows the valuable qualities of the timber. The Central Committee are entitled to a medal for their interesting collection. Mr. B. Mason, Perth, shows exceedingly fine samples of timber in various forms; the mahogany telegraph posts are excellent; the railway sleepers are of first-class quality; the treenails are very good; the mahogany palings are not thought to be practically valuable, but appear to possess great durable

qualities; the posts and rails are excellent; the shingles are very good, and the planks are of fine quality. As a whole, the exhibit is fairly entitled to a medal. The morrell wood produced by the York District Committee is a fine sound timber, and is believed to be that known as Western Australian "bluegum;" this wood, at any rate, is worthy of honourable mention. As regards the exhibits of Mr. John Summers, Perth, of tuartwood, the plank is exceedingly fine, and the scantling is good sound timber; to this honourable mention is awarded.

In the New Zealand Court, Mr. Thomas Kelly exhibits specimens of native timber; these are excellent, and worthy of a medal.

There are three slabs in the Open Court, shown by Messrs. William Jolly and Co., of New South Wales, not mentioned in the Catalogue—one of black butt, one of ironbark, and one of bluegum; these form an excellent exhibit, worthy of a medal.

The Jurors have passed no opinion on the several specimens of limes exhibited, because unable to judge of their relative qualities without practically testing each kind—a mode of dealing with them which is not properly within their province. A suggestion has been made to the Secretary and Manager that it would be desirable for the Inspector-General of Public Works to authorise a duly-qualified foreman from his department to test the whole of the limes, and furnish the Jurors with a report of the result for their guidance. Should this or some similar course be taken, it may not be too late yet for awards on the limes to be given. It may be stated, however, at once, that some of the exhibits of lime are evidently of excellent quality, and that it would be matter of regret if the limes in the Exhibition were to be entirely overlooked.

Reviewing, as a whole, the specimens of materials and manufactures collected and produced by the various colonies represented in this Exhibition that come under this section, the Jurors are of opinion that the general result is exceedingly satisfactory. In manufactured articles used in building the improvement in quality and workmanship that has taken place since the last Exhibition is marked and striking. A considerable number of the woods produced also show that these colonies possess timber of high excellence for practical purposes. It is the duty of the Jurors to select for special commendation the magnificent specimens of timber of various kinds exhibited in the Tasmanian and Western Australian Courts. Whether shown as rough or prepared timber, or in the form of articles manufactured for useful purposes, these woods are characterised by marked excellence. The sound condition of the pile from the Perth Causeway Bridge, taken up after being subject to the influences of wind and water for 25 years, proves the extraordinary lasting qualities of the timber, while many of the specimens exhibited are of great beauty. The logs and planks from Tasmania are fine samples of sound, useful timber, and are remarkable for their great size, for their soundness, and for the absence of a tendency to split and rend.

There are high qualities in many of the woods exhibited which the Jurors do not feel it their province to allude to, because they are called upon to judge them simply as timbers for building purposes.

The Jurors, while discarding any claim to question the wisdom of the policy of the Commission, under which but two modes of recognising merit have been allowed to them—namely, by awarding medals or honourable mention—are impressed with the fact that, in some instances

they would have desired to give higher certificates of merit than those allowed by the rules of the Commission. It is unnecessary to refer to particular instances, but it will probably not be thought out of place to state that some of the exhibits, as a mere matter of comparison with others, are fairly entitled to a recognition beyond that afforded by a medal.

The Jurors have to thank the officers connected with their department for a cordial assistance, by means of which the duty of inspection of exhibits has been materially lightened.

ROBERT ADAMS, C.E., REPORTER.

APPENDIX No. 1.—SECTION 25 A.

21 A'Beckett-street East, February 7th, 1867.

Sir—I have the honour to bring under your notice my closets, &c. (NOT *earth closets*), and direct your attention to the mechanical arrangements for the supply and discharge of the deodorising and disinfecting compounds used.

No. 1. The apparatus fixed to closet numbered in Official Catalogue 1027 is an ordinary hopper upon a hollow shaft, in which is fixed a lever machine on a central axis and self-adjusting slide plates. The lever is graduated with holes for adjusting the slide plates to different charges, and to which motion is given to charge with the deodoriser by raising the lid, the discharge of the same by the SELF-CLOSING ACTION of the lid, thus fully providing for forgetfulness and inattention, insuring a discharge of the deodoriser whenever this closet may be used. One of these apparatuses is exhibited and working most efficiently in the portion of the building set apart for the ladies.

No. 2, not numbered, is a cylindrical machine—a slotted moveable cylinder working within a fixed cylinder, slotted top and bottom, sides. To the axle of moveable cylinder is fixed a common crank, connecting rod, &c., &c. Motion is given by the lid and its *self-closing action*. This is exhibited as a specimen of the mechanical portion of my invention for the use of Woodward's Patent Deodoriser and Disinfecting Powders, and to show its adaptability to be fitted to the common cesspits now in use.

No. 3, not numbered, is also a kind of cylindrical machine, taking its charge of deodoriser from the hopper on each side, as shown in the working model. The inside apparatus is fixed to the lid of closet, and thus does away with any complication of cranks, connecting rods, studs, &c.; the lid will also have the SELF-CLOSING ACTION given to it.

Having given you the mechanical construction of my invention, I beg respectfully to call your attention to my enclosed circular.

I have the honour to be, Sir, your most obedient servant,

FRED. R. G. WOODWARD.

To the Chairman of Jurors in Section 25 A.

APPENDIX No. 2.—SECTION 25 A.

21 A'Beckett-street East, 11th February, 1867.

Sir—I have again the honour to address you on the subject of closets, to be taken under consideration at your meeting this day, and specially to draw your attention to the fact that my exhibit is NOT upon the Earth Closet principle, but a closet with appliances on a much broader system, having for its object *entire*, *perfect*, and SAFE deodorisation and disinfection of human excreta at the time of its deposition, arresting fermentation, and staying injurious decomposition, thus rendering these offensive and obnoxious deposits into an entirely *new compound*, *perfectly inodorous and innocuous*, and most valuable as a fertiliser.

To scientific men it is well known that common earth or loam fails to do this. As a proof, the noxious gases absorbed by the earth or loam may be set free by moisture creating fermentation, thus evidencing the fact that the decomposing animal matters have only been disguised as it were by the large percentage of earth thrown upon them (some 80 odd per cent.).

Again, it is well known that the virus of infectious diseases, such as cholera, typhoid fever, &c., is contained in the excreta of persons so attacked, and that unless these excreta be entirely disinfected at their deposition, a whole neighbourhood is liable to infection by their removal into it. This, sir, is a most lamentable fact, and one that common earth or loam cannot remedy; at the best, earth is *merely* a COVERER of stink, *no disinfectant.*

I have been endeavouring for some time to obtain the report of a Royal Commission upon this very question without success; however, I may give you a kind of digest of the result. In consequence of the appearance of several diseases of unknown type, the attention of the British, French, and German Governments was called to the fact, and a Royal Commission appointed, consisting of the most eminent medical men and chemists of the day, to inquire into the matter. After a tedious and laborious inquiry, visiting places, and taking evidence, they submitted a report to their several Governments, to the effect that they had traced the origin of these new diseases to the introduction of night-soil in a too fresh state as a manure into the agriculture of the neighbourhood of populous cities; and recommended that a law be passed prohibiting the use of night-soil under a five-years' process of deodorisation, unless *disinfected* by chemical process to render it *perfectly innocuous.*

I trust I may be pardoned for my anxiety in endeavouring to bring under your special notice the merits of my invention, constructed expressly for the use of my *father's patent deodorisers* and *disinfectants,* which are now causing so much public attention.

I would refer you to to-day's *Age* for the report of the Chief Medical Officer.

I have the honour to be, sir, your most obedient servant,

FRED. R. G. WOODWARD.

To the Chairman of Jurors, Section 25 A.

APPENDIX No. 3.—SECTION 25 A.

NEW SOUTH WALES COURT.

The fire-brick exhibited was built into the roof of a reverberatory furnace of the Sydney Iron Works; four inches of it allowed to project down below the face of the arch of the roof, so as to let the full flame play upon it. It was under this fierce action for six days and nights, and reported to have stood this severe test equally well, if not better, than any English brick yet used in the colony. Exhibitor, Mr. James Manning, Murimbula, N. S. Wales. (N.B.—This information was furnished by the agent for the New South Wales Court.)

APPENDIX No. 4.—SECTION 25 A.

Mr. A. M'Nicol, Hobart Town, Exhibitor.—Freestone from a quarry at Cambridge, which can be supplied at 2s. per foot. The New Zealand Commissioners, at the request of the Tasmanian Committee, had this building stone subjected to chemical analysis. The chemist says:—"The stone is considered of very superior quality by builders. Its base is eminently silicious, being a coarse sandstone composed of grains of quartz, cemented by a very small proportion of foreign matter. Neither moisture nor the sulphate of soda test affect it to any appreciable extent." In the analyses of freestone, of 24 analyses of stones from most parts of New Zealand, that of Hobart Town silicious sandstone stands at the head of the list, as the highest in true sand, one of the lowest in porosity, and the lowest in substances soluble in acids. The analysis stands thus:—Sp. gr. ozs. cub. foot, 2·710; porosity, 1 (scale, 1 to 10); soluble in acids, 3·02; insoluble in acids, 96·98; soluble silica, trace; alumina, 1·90; oxide of iron, trace; lime, 20; magnesia, trace; water of constitution, 0·78; alkalies, trace. (N.B.—This information was furnished by the agent for the Tasmanian Court.)

Appendix No. 5.—Section 25 a.

Melbourne, March 10th, 1867.

Sir—In accordance with your request I have examined two samples of limestone, and slacked lime made from each. The exhibits of Messrs. Dally, of Ilfracombe, Tasmania, the stone in the N.W. Quadrangle, and the slacked lime in the box in the Annexe, the produce of the same, I have no hesitation in pronouncing of superior quality, and well worthy of the consideration of the Commissioners. The stone in the Annexe and the slacked lime in the cask, the produce of it, are of good quality. This lime has a great quantity of crystals interspersed throughout, which, if caused by the admixture of any deleterious substance, such as clay, &c., would certainly detract from its quality; but I am of opinion it is a crystallization of the lime itself, on account of the angular shape and the hardness of its crystals. This I should consider a good strong lime, but not equal in quality to the before-mentioned lime.

I likewise examined a small bag of slacked lime in the Vestibule, the exhibit of Mr. Slowden. This is very much crystallized, but as there is no stone and the quantity is so small, I can hardly form an opinion of it.

J. H. Stanton, Clerk of Works,
Independent Church, Corner of Collins and Russell streets.

J. G. Knight, Esq., Secretary and Manager Intercolonial Exhibition.

Appendix No. 6.—Section 25 a.

The following prices have been furnished to the Jurors for publication, as those at which Mr. G. D. Guthrie, of Epsom, near Sandhurst, supplies drain pipes of the quality of those exhibited by him:—

Three-inch	pipes at	threepence (3d.)	per foot lineal
Four	,,	fourpence (4d.)	,,
Six	,,	sixpence (6d.)	,,
Nine	,,	one shilling (1s.)	,,
Twelve	,,	two shillings (2s.)	,,

The progress which has been made in the production of colonial joiners' work, &c., is well illustrated by the following Customs return of imported goods; and when the large amount annually expended on foreign timber i staken into consideration, it is much to be regretted that more care and attention are not devoted to utilise our native woods:—

Article.	1860.	1861.	1862.	1863.	1864.	1865.	1866.
	£	£	£	£	£	£	£
Building Materials						11,927	8,791
,, Doors...............	41,549	28,015	15,580	24,775	33,642	17,416	5,711
,, Sashes						8,348	475
Slates	30,346	20,252	23,786	37,987	18,904	28,556	18,923
Stone Paving..................	5,927	2,012	1,158	5,092	2,259	1,385	3,145
Timber, Deals	79,078	64,402	98,811	117,110	58,647	73,975	71,032
,, Sawn......................	196,829	157,933	144,606	158,767	182,094	145,138	152,491
Fire Bricks.....................	2,361	2,259	1,682	903	1,138	954	152

The List of Awards in this Section are as follow:—

MEDALS.

1 Allison, R., Diggers' Rest.—Bricks of various kinds.
333 Cornwall, Alfred.—Stoneware.
337 Dunn, Thomas A., Richmond.—Scagliola Chimneypieces and Pedestals.
992 Draper and Sons.—Earth Closet Commodes.
36 Guthrie, G. D., Sandhurst.—Drain Pipes.
1004 Irving, Glover and Co.—Models of Shutters.
1010 Patent Earth Closet Company.—Earth Closets.
352 Stieling, G. P.—Fire-bricks and Fire-clay.
60 Thorburn, Henry, Castlemaine.—Flagstone.
63 Waugh and Leibouf.—Artificial Stone.
1027 Woodward, George.—Deodorising Portable Tank Closets.

NEW SOUTH WALES.

73 Colonial Architect's Department, N.S.W.—Samples of Timber.
— Jolly, William, and Co., N.S.W.—Timber.
16b Manning, James.—Fire Bricks.

TASMANIA.

— Boyd, J.—Timber.
47 Nicol, A. M.—Freestone, from Cambridge.
45 & 46 Pitfield, J.—Freestone from Kangaroo Point.
477 Toby, C.—Fire Bricks.

WESTERN AUSTRALIA.

— Central Committee, Perth.—Timber.
44 Kelly, Thomas.—Timber.
82-9 Mason, B.—Timber.

HONOURABLE MENTION.

651 Chambers and Clutten.—Slate Bath.
16 Common, Mark.—Slates.
346 Kelly, Thomas.—Drain Pipes.

SANDHURST DIVISION.

4 Cook, Mr.—Slates.
5 Crago, William.—Roofing Slates.
64 Munzell, H.—Model Staircase.
21 Walker, G. F., and Co.—Blackwood.
14 Wolstencroft, J. and W.—Bricks, &c.

OVENS AND MURRAY DIVISION.

3 Casteau, J. B.—Collection of Granite.
30 Duitchman, Joseph.—Timber.
44 Slater, Alvera.—Timber.

WANGARATTA DIVISION.

11 Bevan, T.—Timber.
19 Local Exhibition Committee.—Stringybark.
24 Summers, J. C.—Timber.

NEW SOUTH WALES.

7 Colonial Architect, N.S.W.—Building Stones.
74 Cuthbert, John.—Timber.

TASMANIA.

57 Boyd, J.—Road Metal.
219 Douglas, Adye.—Blackwood.
54 Jackson, Adam.—Freestone, from Ross.

WESTERN AUSTRALIA.

118 Summers, John.—Timber.
116 York District Committee.—Timber.

NEW ZEALAND

18 Meyer, C.—Bricks.

NAVAL AND MILITARY ENGINEERING.

Class VI.—Section 25 b.

BREVET LIEUT.-COL. CHARLES H. SMITH, R.A., CHAIRMAN.

LIEUT.-COL. W. C. TREVOR, C.B., 14TH REGT.
CAPTAIN T. H. KAY, R.N., F.R.S.
CAPTAIN HENRY AMSINCK, R.N.
LIEUT.-COL. J. E. N. BULL, V.V.
LIEUT.-COL. W. T. N. CHAMP, V.V.
CAPTAIN W. H. SNEE, LOCAL STAFF.
CAPTAIN E. PARNELL, V.E.

THE rifle and pistol cartridges exhibited by Mr. Miller deserve honourable mention. The cartridges seem to be carefully and uniformly made; those for the rifle are very generally used, and no complaints have been heard as to their being inferior to imported cartridges. Such a production must prove most useful in a colony, and warlike ammunition being of the utmost importance, the manufacturer deserves patronage and success.

The model by Mr. Morton deserves honourable mention. The model itself is well constructed, and neatly put together. It shows the description of bridge thrown over Jackson's Creek by the Victorian Volunteer Engineers at the last Sunbury encampment, as also of a bridge over the Saltwater River, to the extent of 170 feet, in the year 1866. There is an improvement in the superstructure which gives it an advantage over the old system, as it both adds to its strength and enables it to be thrown over a river with greater celerity. It also enables troops to use it in the shape of rafts when taken to pieces.

These being American and English exhibits, they require no comment, with the exception that thanks are due to the exhibitors for the trouble and expense they have incurred to produce these articles.

Mr. James Brown exhibits the model of a gun, with two bores, for discharging chain shot. It is proposed to load it with loose powder, the charge meeting in a common centre under the vent, and to be fired with the ordinary friction tube. The projectile consists of two solid round shot joined together with a chain, one shot being rammed down each bore of the gun. The inventor considers that it might be made useful against the rigging of ships.

Messrs. Henson and Co. produce a regulation Enfield rifle altered to the Prussian needle breech-loading; kangaroo bullet, rotary rifle, and a bullet-compressing machine; gun-stocks made in the colony of colonial woods, besides many minor inventions bearing upon implements of war. The Jurors have much pleasure in awarding these gentlemen a prize medal for their display of ingenuity in converting the muzzle-loading rifle into one on the breech-loading system; for their general zeal in producing warlike weapons, implements, &c., on improved principles; and also for the introduction and exhibition of a bullet-compressing machine; also, for the improvements on the Westley Richards breech-loading rifle, which enables the weapon to be brought to the full-cock on shutting up the breech.

Mr. Miller exhibits the model of a machine used for filling pistol cartridges, an ingenious method of saving both time and labour in this tedious operation, and for which the exhibitor deserves honourable mention.

Mr. Severn produces the plan of a floating rocket ram, the model of which has been forwarded to the Paris Exhibition. The inventor considers

that a ram propelled on his principle would travel at such a speed, with such tremendous momentum, and carrying with it a weight of several tons, as would penetrate and annihilate any ship of war (either wooden or iron-clad) afloat. The enormous wooden spar attached to the rocket enables the ram to float, and would strike a ship at the water-line. If, on trial, this invention answers, a most powerful engine has been invented to aid in the defence of seacoasts and harbours.

Many of these exhibits are of English manufacture, and therefore need no comment other than that the shot, shell, fuses, &c., were divided into sections for the purpose of exhibiting both in the Railway and Local Military Store Departments, the heads of which deserve thanks for their disinterested trouble.

Captain Sargood, of the Volunteer Artillery at St. Kilda, has imported some 3-pound Whitworth guns entirely at his own expense, which not only shows great *esprit de corps* and zeal on his part, but also assists towards the armament of the colony, and for which the Jurors award him honourable mention.

The Jurors cannot pass over this Section without drawing notice to the model of a 6-pound field gun (smooth-bore) made according to scale at his own expense, by the late Volunteer Armourer, Sergeant Newman, of the R.V.A.R.

1025 Wilson, Ralph.—Models of Floating Batteries.

The merit attached to this model by the inventor arises mainly from the fact that, as Mr. Wilson believes, the hull of any vessel can be converted in a short time into an impregnable battery. His plan is to enclose air-tight iron tanks within heavy baulks of timber on the outer sides of the vessel, the tanks to be a certain distance below the water-line when the vessel is fully armed, and the baulks of timber to be so placed outside and over the tanks as to present two faces, forming an acute angle, which, when covered with railway iron, are supposed by Mr. Wilson to be impervious to shot. The additional buoyancy and stability which the vessel will obtain by these air-tight tanks is presumed to be such that she will never, under any circumstances, sink below her line of flotation.

Broadside guns, with the usual port-holes, which are to be protected overhead by an iron canopy or covering, and a revolving iron turret, with gun (on Captain Cowper Cole's principle), in both bow and stern of the vessel, complete Mr. Wilson's designs.

Without a great amount of calculation as to the displacement of a vessel fitted in this manner, and heavily armed, as it is proposed she should be, it is not possible to give any opinion as to how far the air-tight tanks will give the additional buoyancy which will certainly be necessary to enable the hull of any vessel thus hastily converted to fulfil all that will be required. We think that, as at present contrived, her broadside battery is too much exposed for an efficient fighting vessel. The idea is ingenious, and, as a whole, is worthy of attention, and in our opinion is deserving of honourable mention.

54 Rextraw, Charles, Sandhurst.—Model of an Iron-Clad.

The inventor being unavoidably absent through illness, the meagre explanation afforded by the plan prevented the Jurors from coming to any conclusion on the subject.

Lavater, G. T. A.—Gun and projectile.

Great ingenuity is displayed by Mr. Lavater in bringing the principle of the screw to work on the vent-pieces of guns, whereby they can be worked with fewer numbers. The enormous power of this principle is so well known that on actual experiment being made there seems to be every probability of success. The vent-piece is made to work horizontally from left to right, and, being one solid mass, it is almost impossible that it can be blown out by the force of explosion. The inventor proposes the use of a lubricating wad and tin cap, which he thinks would prevent the escape of gas. For the above the Jurors have great pleasure in awarding Mr. Lavater a prize medal.

The Jurors consider that great credit is due to the Local Military Store Department, under Major Hall, for the construction of the model of the gun from plans handed in by Mr. Lavater.

Mr. Lavater also produces a projectile which can be used either as a shot or shell. It is perforated with three holes running longitudinally, and with a special turn up the projectile, which is conical. This, the inventor imagines, would enable the projectile to be used from smooth-bored guns, the explosion of the charge and the atmosphere giving it the required rotary motion during its flight.

C. H. SMITH, BREVET LIEUT.-COLONEL R.A., REPORTER.

The following is the List of Awards in this Section :—

MEDALS.

1002-3 Henson and Co., Bourke-st. East.—Regulation Enfield Rifle and Bullet-Compressing Machine.
— Lavater, G. T. A.—Guns and Projectiles. Vent-piece for Guns.

HONOURABLE MENTION.—VICTORIA.

534 & 1009 Miller, F. M'D., 131 Westgarth-st. Fitzroy.—Machine for filling Rifle and Pistol Cartridges.
910 Morton, W., Lygon-st., Melbourne.—Model of a Pontoon Bridge.
— Sargood, Captain.—For three presentations of Whitworth Guns.
1015 Severn, H. A.—Model of a Floating Rocket Ram.
1017 Snee, W. H., Captain Local Staff.—Various Guns, Shots, Rifles, Photographs, &c.
1023 Victorian Volunteer Engineers.—Model of a Bridge of Casks.
1025 Wilson, R.—Model of a Floating Battery.

SUBJECTS ILLUSTRATIVE OF THE ETHNOLOGY AND ETHNOTYPY OF AUSTRALIA, NEW CALEDONIA, NEW ZEALAND, AND TASMANIA.

Class VI.—Sub-Section 27.

A. TULK, ESQ., CHAIRMAN. | GEORGE FOORD, ESQ.

MEDAL.—VICTORIA.

486 Le Souef, Albert.—Miniature Native Weapons and Implements used by the Natives of Australia before the advent of Europeans. Made by Exhibitor.

503 Champ, Colonel.—Vocabulary of Six Dialects of Aboriginal Tribes of Victoria (MSS.); Vocabulary of the Parnkalla Language, spoken by the Natives of Spencer's Gulf (MSS.).

— Central Board for Protection of the Aborigines of Victoria.—Collections from different parts of the Province.

HONOURABLE MENTION.—VICTORIA.

— Dunn, E. J.—Collection of Native Tomahawks and Utensils. Collected by Exhibitor.

— Pain, Mrs. H. E.—Ornaments made and worn by the Natives of Australia and South Sea Islands. Collected by Exhibitor.

— Mueller, Dr. Ferdinand, Ph. D., M.D.—Collection of Victorian War Implements.

MEDAL.—SOUTH AUSTRALIA.

91–2 Babbage, B. H.—Book of Pen-and-ink Sketches, made during an exploration into the north-west interior of South Australia in 1858; with Views near Adelaide and Port Lincoln, illustrating the Native Customs.

MEDAL.—WESTERN AUSTRALIA.

134 Central Committee.—Native Weapons, Ornaments, &c.

HONOURABLE MENTION.—WESTERN AUSTRALIA.

135 Shenton, A.—Native Ornaments: Man's Belt and Pearl Shell, Woman's Necklace and Bracelet, both from Roebuck Bay.

136 Turner, James.—A Piece of Net, made by the Natives of De Grey River; also String made by same; some of the Grass it is made from—some as gathered, and some prepared for use.

137 Turner, James.—Piece of Native Stick, or "Wanner," of the De Grey Natives.

MEDAL.—NEW CALEDONIA.

— Colonial Secretary's Department, Noumea.—Samples of Native Workmanship and Articles of Clothing, and Aborigines' Ornaments and Arms.

HONOURABLE MENTION.—NEW CALEDONIA.

— Vieillard, Dr.—Native Woman's Dress, made from Fibres of Cordia.

MEDAL.—NEW SOUTH WALES.

— Ridley, Rev. W.—Kamilaroi, Dippil, and Turrubul—Languages spoken by Australian Natives.

MEDAL.—TASMANIA.

— Abbot, John.—Busts of Tasmanian Natives.

— H. Dowling, Launceston—Busts, Models of Tasmanian Natives.

HONOURABLE MENTION.—TASMANIA.

— Abbott, John.—Bracelets worn by the Aborigines, cut out of the Mutton-fish Shell by the Aborigines.

— Bolter, Alfred.—Governor Davey's Proclamation to the Aborigines, 1816.

534 Danbridge, Mr. J. S.—Head-dresses worn by the Aboriginal Women at the Government House Ball on the Queen's Birthday; also, Shell Necklace worn by the Aboriginal Women.

WORKS ILLUSTRATIVE OF THE NATURAL HISTORY OF AUSTRALIA.

MEDAL.

— Meredith, Mrs. Charles, Hobart Town.—Illustrated Topographical and Natural Historical Works on Australia.

HONOURABLE MENTION.

— Cowie, Miss J.—Botanical Drawings of Native Flowers of Victoria.
— Norton, Mr. Charles.—Drawings of Native Insects of Australia.

MISCELLANEOUS.

Sub-Section 27 a.

C. E. BRIGHT, ESQ., CHAIRMAN.
HON. C. J. JENNER. | REV. J. J. BLEASDALE, D.D.
J. G. KNIGHT, A.I.C.E.

MEDALS.

— Bawden, Thomas, Mayor of Grafton, N.S.W.—For a varied collection of exhibits illustrative of the resources of Grafton, and in recognition of his exertions in promoting the objects of the Exhibition.
— Grant, James, Rokewood.—For the valuable collection of Nuggets preserved by him for exhibition by the Bank of Australasia.
— Levey, Oliver, Melbourne.—For Printing Materials, in wood and Metal, of colonial manufacture.
— Steinmeyer, G. A.—For an admirably executed model of "Life on the Gold Diggings in the Early Days."

HONOURABLE MENTIONS.

— Carson, Mrs.—For Jam made from the Eugenia Myrtifolia.
— Carter, Charles.—For good specimens of Writing on Glass, executed by H. E. Pain.
— Cowling, J., Castlemaine.—For a well-executed Model of a Cottage.
— Ellemore, F.—For good specimens of Graining.
— Ingham, N., Brunswick.—For good specimen of Bluestone Flagging, and in recognition of his having been one of the first to introduce its use.
— Johnston, David.—For Pictures in Berlin Wool.
Kernot, W. C., Civil Engineer.—For his design for a "Warren Girder" Bridge over the Yarra at Swanston-street.
— Patterson, Thomas.—For samples of Opium, Rhubarb, and Turmeric, grown by exhibitor in New South Wales.
— Roberts, S. H.—For imitation of Marbles and Graining.
— Stanway, W. (795).—For improvements in the construction of Easy Chairs.
— Terlecki, Felix.—For good examples of Wood Carving.

SUPPLEMENT.

SPECIAL AWARDS MADE ON BEHALF OF THE COMMISSIONERS BY THE COUNCIL OF CHAIRMEN OF JURORS.

Class 1.

Hartley Kerosene Company, New South Wales.—For zeal and enterprise in developing the mineral riches of New South Wales.

Hayes, Patrick, Footscray.—For enterprise in the erection of extensive works for the manufacture of Kerosene and other Oils from Bituminous Shale.

Smyth, R. Brough.—For great zeal in obtaining and classifying a large collection of Auriferous and other Ores.

Class 2.

Australian Meat Company, Clarence River.—For special excellence of Preserved Meats as a new industry.

Bell, H., Sydney.—For special excellence in the production of Tallow and Neatsfoot Oil.

Gardner, F., Collins-street.—For the special excellence of his extensive collection of Colonial Furs.

Gossage Brothers, Footscray.—For special excellence of Silicated Soaps.

Hobson's Bay Soap and Candle Company.—For special excellence in the production of Soap, Tallow, and Candles.

M'Cracken, R., Hobart Town.—For special excellence of Preserved Meats.

Class 3.

Bencraft, George, Flinders-lane.—For special excellence in the production of Oatmeal, Pearl Barley, and Groats.

Boutan, Mons., New Caledonia.—For enterprise and success in Agricultural and Horticultural Productions; also, for Farm Implements.

Boyd, J., Port Arthur, Tasmania.—For enterprise and good judgment in selecting an extensive and varied collection of Useful and Ornamental Woods.

Bosisto, J., Richmond.—For enterprise and skill in developing the distillation of Essential Oils from native vegetation.

Gilbert, Joseph, South Australia.—For the general excellence of his South Australian Wines, and in recognition of his services and success as a vigneron.

Jolly, W., and Co., New South Wales.—For a specially fine and interesting collection of Woods.

Mason, B., Swan River.—For a specially fine exhibition of Western Australian Woods.

Macarthur, Hon. J. and Sir W.—For special excellence of Wines of New South Wales, and in recognition of their invaluable services in developing colonial resources.

Peake, E. J., South Australia.—For the special excellence of his collection of Wines, and for the care and attention devoted to their development.

Class 4.

Amos, Robert, Carron Mills.—For perseverance and enterprise in establishing the manufacture of Rolled Wrought Iron.

Alderson and Sons, Sydney.—For special proficiency in the production of Enamelled Leather, and in recognition of their enterprise and deserved success in trade.

Brown, James A., Sydney.—For the special importance attached to his manufacture of Glass Carboys, Bottles, &c.

Clark, John, and Sons, Melbourne.—For special excellence in the production of the largest and most varied assortment of Leather shown in the Exhibition, and for the spirit of enterprise which characterises their business.

Collingwood Boot Company.—For the successful establishment on a large scale of a manufactory for strong, useful Boots.

Ebsworth, O. B., Sydney.—Special award for great improvements in the manufacture, pattern, and finish of Colonial Tweeds.

Guthrie, G. D., Sandhurst.—For special excellence in the manufacture of Stoneware Goods.

Hutchison, William, Melbourne.—For enterprise and success in the manufacture of improved Colonial Ovens, Grates, &c.

Hughes and Harvey, Melbourne.—For special excellence in design and finish of Japanned Ware, Wrought Iron Ovens, &c.; and for the superiority of their exhibits generally.

M'Ilwraith, John.—For the successful establishment of a manufactory for Milled Lead.

M'Farland and Sons.—For special excellence in the production of Colonial Saddlery and Harness.

Nitschke, W., Adelaide.—For special merit in the design and manufacture of Distillery Apparatus, and for its great practical value.

Rowden Brothers, Melbourne.—For the value of their introduction of the process of Galvanising Tin and Iron.

Russell, P. N., and Co., Sydney.—For the special excellence of exhibits in Cast Iron, and for their enterprise as Engineers.

Renford, B. B., Western Australia.—For special excellence of the collection of Leather exhibited by him.

Stieling, G. P., Richmond.—For progressive excellence and skill in the manufacture of Potteryware.

Sargood, King and Sargood.—For enterprise and success in establishing on an extensive scale a large manufactory for Slop Clothing.

Williams, W., Yarra Bank.—For special excellence of his massive Iron Forgings, and practical value of such work for engineering purposes.

Zevenboom and Stone, Melbourne.—For the successful establishment of a manufactory for Brushware, and for the special excellence of their exhibits.

Class 5.

Alcock and Co., Melbourne.—For special excellence of workmanship and taste in design of Billiard Tables, for enterprise in successfully establishing a large manufactory, and for the introduction, as far as practicable, of colonial materials.

Ferguson, Urie and Lyon.—For enterprise and skill in the production of Stained Glass for ecclesiastical purposes, and for their liberal contributions to the Mediæval Court.

Livingstone, D., Melbourne.—For special excellence in the production of Ornamental Metal Work; remarkable for good taste and refinement of design.

Meredith, Mrs. C., Tasmania.—For special excellence of Drawings illustrative of the Natural History of Tasmania, and in recognition of her refined literary and artistic taste. (See *Hunt's Handbook to the Exhibition of* 1862.)

Noone, J., Melbourne.—For perseverance and success in carrying out Mr. Osborne's process of Photo-lithography.

Wright, Archibald, Sydney.—For the special importance attached to his successful establishment of a Type Foundry.

Young, John, Melbourne.—For enterprise and success in the production of Mediæval Metal Work, and the excellence of his collection of objects shown in the Mediæval Court.

Class 6.

Allison, R., Diggers' Rest.—For special merit in the manufacture of Bricks of superior quality.

Borthwick, Alexander.—For the practical value and successful application of his Anti-fouling Composition for the Coating of Iron Ships.

Home, J. W., Melbourne.—For special excellence in the manufacture of Travelling Box Wool Press and other exhibits.

Mellor, J., Adelaide.—For enterprise and success in the establishment of a large manufactory for Agricultural Implements, and for the varied collection of exhibits shown at the Intercolonial Exhibition.

Pain, Mr. and Mrs., Melbourne.—For the splendid collection of Specimens of Natural History exhibited by them, and for the skill and taste with which they were displayed.

Robinson, J., and Co., Elizabeth-street.—For general excellence of their large collection of exhibits, and for their enterprise and success as manufacturers of Agricultural Implements.

Stevenson and Elliot, Melbourne.—For special excellence of design and workmanship, and elegance of finish, of their C Spring Barouche; and for enterprise and success as Carriage Builders.

HORTICULTURE.

THE Commissioners of the Intercolonial Exhibition, being desirous that it should embrace the industries of all classes, obtained the co-operation of the Horticultural Society of Victoria, with the view to securing periodical displays of garden produce.

Three shows, at intervals of a month, were held on the reserve behind the main building, the society waiving its own regular shows in the pure interest of the objects contemplated by the Commissioners, and generally taking charge of the management and effective arrangement of the exhibits on these special occasions.

The flowers, fruits, and culinary vegetables thus brought for competition evince a very high state of intelligence and skill in the cultivators; and when we reflect that the success of the nurseryman and florist is at all times dependent upon the taste and appreciation of his skill by his customers, the Commissioners have grounds for public congratulation that so healthy and civilising a taste as gardening is becoming so generally diffused.

These displays prove beyond doubt that the new fruits and flowers of the season shown at English exhibitions are speedily imported and propagated by our nurserymen, and offered for sale the following season; and while this enterprise is shown as a mere matter of business, our cultivators are not unmindful of the importance of producing new and useful varieties better adapted to our climate and requirements.

Several very meritorious colonial hybrids were shown, and it is matter for regret that, owing to the closing of the Exhibition, no opportunity was offered for an autumn show of fruits, as no doubt many valuable varieties raised by colonial growers would have been noted.

WILLIAM CLARSON, REPORTER.

The following are the Awards of the Judges for the Horticultural Society of Victoria, at the shows held in the grounds of the Intercolonial Exhibition, on the 10th of November and 8th of December, 1866, and on the 16th of January, 1867 :—

MEDALS.

Brunning, G., nurseryman, St. Kilda.—For collection of Pelargoniums (10 varieties).
Carter, W., Emerald Hill.—For collections of Plants, Fuchsias, and Pelargoniums.
Cheeseman, T., gardener to S. Martin, Esq., Richmond.—For collection of Ferns and Lycopods (20 species); collection of not less than eight Plants in bloom.
Chandler, W., Cheltenham.—For Cauliflowers (10 heads).
Cole, J. C., Richmond Nursery, Richmond.—For fine collections of Gooseberries, Cherries, and other Fruits; Peas and Asparagus.
Cole, T. C., "Twyford," Hawthorn.—For collection of Strawberries (6 varieties), 1 dish each.
Craig, W., Ballarat.—For Cucumbers (3 brace).
Cunningham, L., gardener to C. E. Bright, Esq.—For collection of Geraniums 10 varieties); Pelargoniums (10 varieties).
Ferguson, W., gardener to Hugh Glass, Esq.—For collections of Plants in bloom; Oranges, Lemons, Citrons, &c. (20 species); Ferns and Lycopods; Ornamental Foliage Plants (10 varieties).
Harris, J., South Yarra.—For collection of Coniferous Plants (20 species).
Johnson, T., Hawthorn.—For collection of Roses (48 varieties), single blooms.
Lang, T., and Co., Ballarat.—For collection of Gladioli (24 varieties).
Martin, Septimus, "Vaucluse."—For a most tasteful Arrangement of Flowers in Vase.
Miller, J., Brighton.—For Rhubarb (18 stalks).
Moule, F. G., Brighton.—For Roses (24 varieties).
Moule, Mrs. F. G., Brighton.—For the most tasteful Arrangement of Flowers in Vase.
Pike, Mrs., South Yarra.—For general collection of Plants; Pelargoniums; and miscellaneous collection of Cut Flowers (20 varieties).
Pratt, G., gardener to W. Hammill, Esq., Toorak.—For collection of Roses (24 varieties), 3 blooms each.
Ronalds, N., Richmond Nursery.—For general collection of Cut Flowers (50 varieties); Fuchsias (10 varieties); collection of Dianthus, Pinks, &c., &c. (24 varieties).
Scott, J., Hawthorn Nursery.—For general collection of Cut Flowers; Fuchsias (10 varieties); collection of Cut Flowers (50 varieties).
Shaw, J., gardener to Sir Redmond Barry.—For collection of Almonds, Apricots, Plums, Capsicums, Kidney Beans, Gherkins, Peas, Cucumbers, Vegetable Marrows, &c., &c.
Smith, J., and Son, Riddell's Creek.—Collection of Strawberries (6 varieties), 1 dish each; collection of Peas (6 varieties).
Snowden, Mrs. A., Abbotsford.—For a most tasteful Arrangement of Flowers in Vase.
Stone, C., Brighton.—For collection of Cucumbers, Rhubarb, and Potatoes (4 varieties).
Stuart, A., gardener to R. B. Ronalds, Esq., South Yarra.—For collections of Fuchsias (10 varieties); Herbaceous Plants (10 varieties); general collection of Cut Flowers.
Taylor and Sangster, Toorak Nursery.—For collections of Coniferous Plants (20 species); Azaleas (6 varieties); Ornamental Foliage Plants (10 varieties); general collection of Cut Flowers (50 varieties).
West, J., Brighton.—For Vegetables, miscellaneous collection (12 varieties); Potatoes (4 varieties); Cabbages (10 heads).

CERTIFICATES.

Adams, R., St. Kilda.—For Kidney Potatoes.
Breech, W., Prahran.—For Peaches, Plums.

Brunning, G., nurseryman, St. Kilda.—For Dianthus (Hybrid); collections of Carnations, Picotees, Pelargoniums, Phloxes (Herbaceous), Phlox Drummondi, Petunias; collection Fuchsia Blooms; Single Pelargonium.

Bull, Miss, Brighton.—For Hand and Bridal Bouquets.

Burton, P. J., Darebin Creek.—For Culinary Herbs—Peas, Broad Beans, Asparagus.

Burton, P. J., Darebin Creek.—For Asparagus, Artichokes, Cluster of Peas.

Carter, W., Emerald Hill.—For Pansies (6 varieties); Sweet William (6 varieties); Picotees (6 varieties); Antirrhinums (6 varieties); Pelargoniums (6 varieties, 3 trusses each); Petunias (6 varieties, 3 trusses each); Roses, single bloom, dark; Carnations, single bloom; Picotees, single bloom; Gladioli, single bloom; Verbenas, single bloom, 3 trusses each; Phlox Perennial.

Cader, A., Orong-road, Toorak.—For show of Cabbages.

Chandler, W., Cheltenham.—For Cauliflowers (3 heads).

Cheeseman, T., gardener to S. Martin, Esq.—For collection of not less than eight Plants in bloom; Pelargoniums (10 varieties); Gloxinias (5 varieties); Hydrangea.

Cole, J. C., Richmond Nursery.—For Pears (dessert), Cherries, Loquats, Rhubarb, Gooseberries (best dish); Red Dessert Plums.

Cunningham, L., gardener to C. E. Bright, Esq., South Yarra.—For collection of Geraniums (10 varieties).

Dods, A., Bridge-road Nursery, Richmond.—For Hand and Bridal Bouquets, Plums (Red Kitchen).

Dunstan, C., Pentridge.—For collection of Peas (6 varieties); Cabbages, Lettuce, Potatoes (4 varieties), Kidney Potatoes, Carrots, Turnips, Onions, Round Potatoes.

Ella, J., Rockingham, Kew.—For Plums (best dish).

Ferguson, W., gardener to Hugh Glass, Esq.—For collection of Ferns and Lycopods (20 species); collection of three Plants in Flower; Orchid, single specimen in bloom; Oranges, best dish; Lemons, best dish; Vine of Queensland, Shade Tree, Petunia (5 varieties).

Hayes, E., Cheltenham.—For Onions (12 dried bulbs).

Holt, W., Kew.—For Loquats (best dish).

Keybourn, —, Brighton.—For collection of Gladioli (12 varieties).

Knight, G. W., Riddell's Creek.—For collection of Gooseberries (10 varieties, 1 dish each).

Lang, T., and Co., Ballarat.—For Ranunculus (6 varieties); Pansies (12 varieties); Pansies (6 varieties).

Lynch, G., Abbotsford.—For Arrowroot and Plants.

Maplestone, C., Esq., Ivanhoe.—For Grapes.

Messrs. B. and S. Johnston, Thomastown.—For collection of Petunias.

Murdoch, W. A. J., Boroondara.—For Strawberries (best dish); Asparagus, Round Potatoes.

Pankhurst, T., Kew.—For Gooseberries (best dish).

Pike, Mrs., South Yarra.—For single specimen Plant in bloom, Calceolaria (single specimen); Pelargoniums (single specimen); Ferns (6 varieties); Ornamental Plants, Silkworms, Orchids.

Pratt, G., gardener to W. Hammill, Esq., Toorak.—For Roses (collection of 48 varieties), single blooms; Cucumbers (1 brace).

Roberts, J., Hawthorn.—For Apples (dessert), Apples (cooking), Pears (dessert), Pears (cooking), Peaches, French Beans (single dish).

Robinson, J.—For Parsnip (6 roots).

Ronalds, N., Excelsior Nursery, Richmond.—For Pelargoniums, fancy (4 varieties); Verbenas (18 varieties, 5 trusses each); Fuchsia (3 varieties); Verbenas (18 varieties, 5 trusses each); Verbenas (18 varieties, 5 trusses each); Verbenas (9 varieties, 5 trusses each); Pentstemon; Table Bouquet.

Rosewarne, J., Boroondara.—For Cauliflowers (10 heads); Broad Beans (single dish).

Scott, J., Hawthorn Nursery.—For collection of Coniferous Plants (20 species); Ornamental Foliage Plants (10 varieties); Hand and Bridal Bouquets; Antirrhinums (6 varieties); Pelargoniums (3 varieties in bloom); Fuchsia (3 varieties); Fuchsias, light and dark; Petunias, light and dark; Seedling Pelargoniums.

Search, F., Esq., Flemington.—For collection of Roses (12 varieties), single blooms.

Sims, G. J., Brighton.—For Roses (dark and light); Verbenas (6 varieties); Phlox Drummondi, Invincible Scarlet Pea, Carnations.

Smith, J., and Son, Riddell's Creek.—For Peas, Plums (Rivers's Early Prolific), Strawberries.

Stone, C., Brighton.—For Onions (12 green bulbs); Rhubarb (18 stalks); Leeks; French Beans (single dish); Cherries (best dish); Cucumbers (1 brace); Yellow Kitchen Plums.

Stuart, A., gardener to R. B. Ronalds, Esq., South Yarra.—For Fuchsia (3 varieties); collection of Sweet William; collection of Annuals; collection of Phlox Drummondi, Antirrhinums, Achimenes.

Taylor and Sangster, Toorak Nursery, South Yarra.—For collections of Pelargoniums, Azaleas, Coniferous Plants (20 species); Herbaceous Plants (5 varieties); collection of Dianthus, Pinks, &c., &c.; collection of Fuchsias (10 varieties); Begonia.

Whatmough, R., River Plenty, Greensborough.—For Dessert Apples.

West, J., Moorabbin.—For Kidney Potatoes, Carrots, Turnips, Round Potatoes, Rhubarb, Onions.

Wyatt, C., Geelong.—For Cherries (best dish); Apricots (best dish).

INTERCOLONIAL EXHIBITION ESSAYS, 1866-67.

No. I.

THE PROGRESS OF VICTORIA:

A Statistical Essay.

By WILLIAM HENRY ARCHER,

REGISTRAR-GENERAL OF VICTORIA;

HONORARY CORRESPONDING MEMBER OF THE STATISTICAL SOCIETY OF LONDON, ETC.

PREFACE.

THIS Essay is intended as an Introductory Handbook to the annually-published Statistics of Victoria.

It was originally contemplated to obtain the Comparative Statistics of all Australia, by a contribution on a uniform plan from each colony. To that end, I furnished the President of the Royal Commission of the Intercolonial Exhibition (His Honour Sir REDMOND BARRY) with a comprehensive series of statistical forms; but as these have never been returned to me duly filled up, insuperable difficulties I presume were found in obtaining the desired information in sufficient time for the purpose of the Exhibition.

The projected volume, illustrative of the comparative development of national life up to a recent date throughout all Australia, has, therefore, yet to be written.

It may not be uninteresting to state that the path of statistical inquiry in relation to Australia generally has been greatly smoothed by the action of Australian Governments in 1861. In the month of October in that year, representatives of New South Wales, South Australia, and Queensland were authorised to proceed to Melbourne, and to confer with the Registrar-General of Victoria on the existing methods of collecting and tabulating statistical data, in order to determine how far closer uniformity of united action might be developed for the future.

The representatives who consequently met and conferred together were CHRISTOPHER ROLLESTON, Esq., Registrar-General of New South Wales; JOSIAH BOOTHBY, Esq., Government Statist of South Australia; FREDERICK ORME DARVALL, Esq., Registrar-General of Queensland; and myself.

The spirit of co-operation evinced at our congress five years ago exists still, and just as in regard to the collection and tabulation of the Census of

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the population, and the recording and tabulating of Vital Statistics, we are thoroughly at one, so I trust we shall, year by year, continue to approximate more and more closely in relation both to identity of purpose and uniformity of process in respect to every kind of statistical work.

Some portions of the following pages, such as, for example, the notes on "Our Rising Race," treat of special points of interest not noticed in the Annual Blue Books. They will, perhaps, be deemed not the least interesting of the matters developed.

All who have ever attempted to work up statistical data will readily appreciate the great amount of methodised skilled labour necessary to the accurate combination of facts as herein presented. In dealing with the vast mass of figures whence those now furnished were drawn, it is hardly possible to escape some inaccuracy. But it is hoped there exists no error of importance. Should any mistake whatever be discovered, I shall be most thankful to have it pointed out, however trifling that mistake may be. "Trifles," said the old master, "make perfection, and perfection is no trifle."

I could not have got this little work out in the time allotted, without zealous co-operation on the part of officers of my department; and I feel much pleasure in recognising the assiduity and intelligent aid afforded me by the senior clerk of the statistic branch, Mr. Hayter, and other officers, in regard to much labour done out of ordinary course.

W. H. A.

Melbourne, 31st December, 1866.

PROGRESS OF VICTORIA.

GEOGRAPHICAL POSITION OF VICTORIA.

VICTORIA is situated at the south-east of the continent of Australia, and lies between the 34th and 39th parallels of south latitude and the 141st and 150th meridians of east longitude. Its extreme length from east to west is about 420 miles, and its greatest breadth is about 260 miles. Its extent of coast line is nearly 600 miles.

BOUNDARIES.

2. It is bounded on the west by the colony of South Australia, the dividing line being the 141st meridian. On the north and north-east it is bounded by the colony of New South Wales, from which it is separated by the River Murray, and an imaginary line reaching from the head waters of that stream, at Forest Hill, to Cape Howe. On the south and south-east its shores are washed by the Southern Ocean.

MISLEADING NOMENCLATURE OF A NEIGHBOURING COLONY.

3. In consequence of its position at the extreme south of the Australian continent, Victoria is often mistaken by English writers, and others not well acquainted with Australian geography, for an adjoining colony, which is topographically misnamed South Australia; the truth being that scarcely any part of South Australia is situated as far south as the most northern portion of Victoria.

4. The southernmost point in Victoria, and consequently in the whole of Australia, is Wilson's Promontory, which lies in lat. 39° 7′ S., long. 146° 26′ E.; the northernmost point is the place where the western boundary of the colony intersects the Murray, lat. 34° S., long. 141° E.; the point furthest east is Cape Howe, situated in lat. 37° 30′ S., long. 150° 7′ E.; the most westerly point is the whole western frontier, which lies upon the meridian 141° E. (as has been already stated), and extends from lat. 34° S. to lat. 38° 4′ S., or more than 240 miles.

GEOGRAPHICAL POSITION OF MELBOURNE

5. Prior to the establishment of a Government Observatory, the point of observation chosen to indicate the position of Melbourne, the capital

of Victoria, was Batman's Hill, an elevation at the western end of the city, which has recently been cut away in order to afford station accommodation for the Victorian Railways. The latitude of the site of Batman's Hill* has been determined to be 37° 49′ 23″ S. Its longitude was formerly received as 144° 58′ 15·6″ E., but Mr. C. J. Tyers, Commissioner of Crown Lands, Gippsland, forwarded a memorandum to His Excellency C. J. Latrobe, on the 6th December, 1853, by which he showed that, using the meridian distance between Fort Macquarie, at Sydney (the longitude of which had been determined by numerous observations), and Batman's Hill, the true longitude of the latter should be 144° 58′ 35″ E., or twenty seconds to the eastward of what was previously supposed. Mr. Tyers subsequently furnished a statement of its longitude, deduced from calculations on the annular eclipse of the sun of the 1st February, 1851, observed at Parramatta by the late Rear-Admiral King; at the Government Observatory, Hobart Town, by Captain Kay, R.N.; and at Batman's Hill, Melbourne, by Messrs. Groves and Robertson.†

The following are the results :—

	Long. of Batman's Hill.
Annular Eclipse of the Sun, 1st February, 1851, observed by the late Rear-Admiral King, at his Observatory, Parramatta, lat. 33° 48′ 50″ S., long. 10h. 4m. 6·25s. E., commenced at 4h. 6m. 6s. mean time.	144° 58′ 34″ E.
Observed by Capt. Kay, R.N., at the Government Observatory, Hobart Town, lat. 42° 52′ S., long. 9h. 49m. 30s. E., commenced 3h. 30m. 9s. mean time; alt. 41° 19′	144° 58′ 0·7″ E.
Observed by Messrs. Groves and Robertson, at Batman's Hill, Melbourne, commenced at 3h. 27m. 55·7s. mean time; alt. 43°........	144° 58′ 52″ E.

The mean of these three observations gives the longitude of Batman's Hill as 144° 58′ 28·9″ E.

6. The first site on which an observatory was erected in Melbourne was Flagstaff Hill, on the north-west side of the city, the chief portion of the latter bearing from it between south-east and east-south-east; and from a series of observations made by Professor Neumayer, during 1858 and 1859, its position was ascertained to be—Latitude 37° 48′ 45″ S.; longitude, 9h. 39m. 53s., or 144° 58′ 15″ E. In September, 1862, the observatory staff removed to the present Melbourne Observatory, a new building situated in the Government Reserve on the south side of the Yarra. From this point the tower of the old Flagstaff Observatory bears north 41° 31′ 65″ W., and is distant 1·51 nautical mile. From numerous observations made on the pier, especially erected for the determination of the astronomical meridian, Professor Neumayer pronounces the Melbourne observatory to be in latitude 37° 49′ 59″ S., longitude 9h. 39m. 58s., or 144° 59′ 30″ E.†

AREA OF VICTORIA.

7. The area of Victoria is 86,831 square miles, or 55,571,840 acres. The whole continent of Australia is estimated to contain about 3,000,000 of

* See Archer's *Statistical Register of Victoria*, pp. 1 and 2. Ferres, Melbourne, 1854.

† See *Results of Meteorological Observations, taken in the Colony of Victoria*, 1859-1862, p. 11, by George Neumayer. Ferres, Melbourne, 1864.

square miles, and Victoria consequently occupies barely a thirty-fourth part of its surface. Great Britain, exclusive of the islands in the British seas, contains 89,644* square miles, and is therefore slightly larger than Victoria.

MOUNTAINS.

8. Victoria is traversed with more or less regularity throughout its whole length by a chain of hills completely dividing it into two parts, and thence called the Dividing Range. This range runs in an east and west direction, generally at a distance of 60 or 70 miles from the coast. The streams to the north of it run towards the Murray, those to the south of it towards the sea. The eastern part of it, which divides the Gippsland district from that of the Murray, is called the Australian Alps, and that part which separates the Wimmera district from the county of Ripon, is called the Pyrenees. There are also other ranges extending in different parts of the country, many of which are offshoots of the main chain. The principal are the Benambra mountains, the Gibbo, Bogong, Buffalo, and Futter ranges in the Murray district; the Delegete, Mount Wellington, Baw Baw, Hoddle, and Strzelecki ranges, in Gippsland; the Mount Alexander range, in the Loddon district and county of Talbot; the Grampians, Victoria, and Sierra ranges, in the counties of Dundas and Ripon and the Wimmera district.

9. A list of the mountains and hills in Victoria, showing also the county or district in which they are situated, and the elevation of the principal peaks above the level of the sea, according to the latest information in the possession of the Survey Department, is given in Appendix A.

RIVERS.

10. The rivers in Victoria are for the most part of inconsiderable size. Many of them are subject to be partially dried up during the summer months, so as to be reduced at that season to mere chains of waterholes. With the exception of the Yarra, on the banks of which the metropolis is situated, the Goulburn, which empties itself into the Murray about eight miles to the eastward of Echuca, and the Murray itself, with perhaps some of the Gippsland streams, not one of them is navigable, except by boats. As, however, they collect the watershed of large areas of country, they will ultimately be made feeders to permanent reservoirs for the purposes of irrigation, gold washing, and manufactures. By simply running dams across their beds in suitable localities, great benefit may be produced at a comparatively small cost.

11. The names of the principal rivers in Victoria, with their position and approximate lengths, have been supplied by the Survey Department, and will be found in Appendix B.

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* The area of Great Britain, inclusive of islands, is 90,038 square miles, which is made up as follows:—England, 50,922 square miles; Wales, 7398 square miles; Scotland, 31,324 square miles; Islands in the British Seas, 394 square miles. (See *Report upon the Census of Great Britain*, 1851, p. lvi.)

LAKES.

12. Victoria contains numerous salt and fresh water lakes and lagoons, but many of these are little more than swamps during dry seasons. Lake Korangamite (counties Grenville and Hampden), the largest inland lake in the colony, covers 76 square miles, and is quite salt, notwithstanding its augmentation by numerous fresh-water streams. It has no visible outlet. Lake Colac (county Polwarth), only a few miles distant from Lake Korangamite, is a beautiful sheet of water, 10 square miles in extent and quite fresh. Lake Burrumbeet, in the county of Ripon, is also a fine sheet of fresh water, embracing an area of 8½ square miles. The Gippsland lakes—Victoria, Reeve, King, and Bungaa—are situated close to the coast, and are only separated from the sea by a narrow belt of sand. Through this there is an entrance, which is often navigable, but is subject to be closed at irregular intervals, in consequence of the shifting of the sand at its mouth. Lake Wellington, the largest of all the Gippsland lakes, lies to the westward of Lakes Reeve and Victoria, and is connected with the latter by a narrow channel.

13. A list of the lakes in Victoria (with their localities and areas) has been supplied by the Survey Department, and will be found in Appendix C.

CLIMATE.

14. From its geographical position, Victoria enjoys a climate far more genial to Europeans than any other colony within the continent of Australia. In regard to heat, the weather is never severely oppressive except during the prevalence of hot northerly winds, and these occur only at intervals during the summer months.

15. The following table gives, during each of the last six years, the highest, lowest, and mean temperature in the shade, and the mean atmospheric pressure (both calculated from a reduced mean corresponding with that of 24 hourly observations taken each day); also, the number of days on which rain fell, the amount of rainfall, and the mean relative humidity, as registered at the Flagstaff and Melbourne Observatories; also, the means of these observations for the whole sexennial period, 1860-1865.

TABLE I.—METEOROLOGICAL OBSERVATIONS, MELBOURNE, 1860-1865.

Year.	Temperature in the Shade.			Mean Atmospheric Pressure.*	Days on which Rain Fell.	Amount of Rainfall.	Mean Relative Humidity.
	Maximum during each Year.	Minimum during each Year.	Mean.				
	Deg.	Deg.	Deg.	Inches.	Number.	Inches.	1·0
1860	111·0	29·0	57·9	29·923	173	25·058	0·717
1861	98·4	31·8	58·0	29·871	188	29·146	0·718
1862	111·2	33·0	58·3	29·889	176	22·076	0·705
1863	104·6	28·3	57·5	29·894	171	36·428	0·729
1864	96·6	30·5	57·0	29·945	153	27·398	0·723
1865	103·4	30·9	56·5	29·936	139	15·920	0·678
Means	104·2	30·6	57·5	29·910	166·5	26·004	0·712

* Until September, 1862, the readings were at the Flagstaff Observatory, which is 120·7 feet above the level of the sea. After that period the readings were at the Melbourne Observatory, which is 91·3 feet above the sea level. A deduction of 0·029 inches requires to be made from the barometrical observations at the former place to make them comparable with those at the latter. With respect to comparisons generally between country and country in relation to climate, it is greatly to be desired that some uniform standard should be adopted of determining the daily thermometrical, barometrical, and other means. The varying modes now adopted in all parts of the world render it very difficult to ascertain how far the climate of one locality is comparable with that of another, and hence I have mentioned the fact that the Melbourne observations, being calculated from a reduced mean, correspond with that of 24 hourly observations taken daily.

HOT WINDS.

16. The average number of hot winds for the colony generally is, according to Professor Neumayer, eight or nine per annum. Their frequency varies in different districts. At Melbourne and Castlemaine, he states the average number to be fourteen; at Sandhurst, Heathcote, and Portland, eleven; at Beechworth, Ararat, and Swan Hill, eight; at Geelong and Ballarat, six; and at Alberton and Camperdown, three.

ICE.

17. Ice is occasionally seen during the winter months. The number of frosts in different parts of the country of course differs according to the elevation above the sea level and other local circumstances. Professor Neumayer states that the average number of frosts is 35 at Heathcote, 16 at Ballarat, and 11 at Beechworth.*

HOTTEST AND COLDEST MONTHS.

18. The hottest month in Melbourne is January, the mean temperature being 66° over a period of six years; and the coldest, July, in which the mean temperature during the same period was 48·1°. The atmospheric pressure is greatest in August, the average in six years being 30 inches; and least in November, 29·7 inches. Most rainy days occur in August, and fewest in February, the average numbers in those months being respectively 18 and 9. The greatest volume of rain falls, on the average, in December, the mean for that month extending over six years being 3·29 inches; and the smallest in June, for which the mean was 1·4 inch. The air is moistest in June and driest in November, the mean relative humidity over six years being ·808 in the former and ·633 in the latter month, it being understood that the unit is indicative of complete saturation. These results, and the averages of the same elements for the remaining months, will be found by reference to the following table.

TABLE II.—METEOROLOGICAL OBSERVATIONS, MELBOURNE, MONTHLY AVERAGES, 1860-1865.

MONTHS.	MEANS IN MELBOURNE DURING THE SIX YEARS 1860-1865.				
	Mean Temperature in the Shade.	Mean height of Barometer.	Mean number of days on which Rain fell.	Mean amount of Rainfall.	Mean relative Humidity.
	Deg.	Inches.	Days.	Inches.	1·0
January	66·0	29·807	10·0	1·964	0·635
February	65·1	29·852	9·2	1·407	0·655
March	64·7	29·936	10·2	2·064	0·676
April	59·2	29 986	13·0	2·732	0·734
May	53·1	29·962	17·1	2·274	0·767
June	49·3	29·994	12 1	1·395	0·808
July	48·1	29·934	16·0	2·111	0·799
August	49 3	30·018	18·0	1·947	0·773
September	54·3	29·729	17·2	2·042	0·702
October	57·0	29 882	17·0	3·177	0·701
November	61·2	29·691	13·0	1·605	0·633
December	63 0	29·789	13·0	3·293	0·658
Yearly means	57·5	29·910	166·5	26·004	0·712

* See Neumayer's "Climatological Outlines of the Colony of Victoria," *Victorian Exhibition Catalogue*, 1861.

MAXIMUM HEAT IN THE SHADE.

19. The thermometer in the shade at the Government Observatory has risen above 100° Fahrenheit upon ten different days during the last six years. The following are the dates and the highest readings :—

		Deg.
Jan. 21, 1860,	Maximum of Thermometer	108·8
,, 22, ,,	,,	111·0
Jan. 13, 1862	,,	105·0
,, 14, ,,	,,	111·2
Dec. 31, ,,	,,	107·2
Jan. 8, 1863	,,	104·6
Feb. 1, ,,	,,	103·9
,, 2, ,,	,,	104·0
Feb. 27, 1865	,,	103·4
Dec. 27, ,,	,,	101·8

MINIMUM TEMPERATURE.

20. Fifteen instances during the same six years were recorded of the thermometer falling to or below the freezing point. The following are the dates and lowest points indicated :—

		Deg.
July 13, 1860,	Minimum of Thermometer	29·7
,, 14, ,,	,,	29·0
,, 19, ,,	,,	31·1
,, 20, ,,	,,	31·7
July 24, 1861	,,	31·8
Aug. 11, 1863	,,	28·3
,, 12, ,,	,,	29·8
,, 13, ,,	,,	29·0
July 4, 1864	,,	30·5
June 13, 1865	,,	32·0
,, 14, ,,	,,	32·0
,, 15, ,,	,,	32·0
July 5, ,,	,,	31·7
,, 21, ,,	,,	30·9
,, 22, ,,	,,	32·0

It will be observed that the thermometer never rose as high as 100° in 1861, that it never fell so low as 32° in 1862, and that it never rose to 100° in 1864.

POPULATION.

SETTLEMENT OF PORT PHILLIP IN 1835.

21. A generation has passed away since a small craft, aptly named "The Enterprise," was moored fast to some trees on the banks of the Yarra, at the foot of a well-grassed hill. The hill, called Pleasant Hill* by the new comers, has disappeared ; but the little companionhood of fourteen souls borne by that craft on the 15th August, 1835, has widened into a people. The following table, deduced from private as well as public records, shows the progress of population in Victoria from 1835 to the year in which I now write—1866.

* Subsequently named Batman's Hill. It has recently been cut down by the sharp edge of commercial activity.

TABLE III.—POPULATION OF VICTORIA (FORMERLY THE DISTRICT OF PORT PHILLIP), 1836-1866.

Date of Census.	Males.	Females.	Total.	No of Females to every 100 males.
May 25, 1836	142	35	177	24·6
Nov. 8, 1836	186	38	224	20·4
Sept. 12, 1838	3,080	431	3,511	14·0
March 2, 1841	8,274	3,464	11,738	41·9
March 2, 1846	20,184	12,695	32,879	62·9
March 2, 1851	46,202	31,143	77,345	67·4
April 26, 1854	155,876	80,900	236,776*	51·9
March 29, 1857	264,334	146,432	410,766	55·4
April 7, 1861	328,651	211,671	540,322	64·4
June 30, 1866†	360,427	272,571	632,998	75·6

BIRTHPLACES OF THE PEOPLE.

22. Most of the present inhabitants of Victoria, as is well known, have found their way hither from other parts of the globe, and the relative proportion of different nationalities one to another has naturally changed from time to time with the varying streams of immigration. The English born have, however, at every census-taking, been foremost in the list of nationalities, the Irish-born have as invariably been second, and the Scotch born third. This gradation applies to the scale of nationalities exclusive of the Australian born, who, as might be expected, are gradually but surely increasing in weight of numbers from year to year.

IRISH BORN COMPARED WITH ENGLISH BORN.

23. In 1846 there were (within a thousand) as many inhabitants of Irish birth as of English birth—viz., 9126 Irish born to 10,100 English born. Five years later (in 1851) the numbers had changed to 14,168 Irish born against 28,908 English born—that is to say, the Irish born, instead of showing in 1851 as in 1846 nearly an equality in number to the English born, presented a proportion equal to scarcely a half; and the latter proportion was found to subsist between the two nationalities, ten years later, at the census-taking of 1861.

SCOTCH BORN COMPARED WITH ENGLISH BORN.

24. Again, the Scotch born, as compared with the English born, stood in 1846 in the proportion of 4225 to 10,100, or about 42 per cent. of

* 22, unspecified as to sex, omitted.

† The figures here given for 1866 are an estimate only. No census has been taken since 1861. A bill which was brought forward by the Government for taking the usual quinquennial census in 1866 was lost in the Assembly by a small majority. It is now probable that the population will not be again enumerated until the date of the next British decennial census, i.e., in the early part of 1871. In the meantime, an estimate of the population is made up quarterly in the Registrar-General's department, from the records of births and deaths and of arrivals and departures. By this means the gross numbers of both sexes are approximately determined.

those of English birth; but in no subsequent census has so high a proportion obtained. In 1861 the Scotch born showed 60,701 to 169,586, or but little more than a third of the English born.

SCOTCH BORN COMPARED WITH IRISH BORN.

25. On comparing the Scotch born with the Irish born, very remarkable differences appear at the census periods. In 1846 the Irish born were as 9126 to 4225, or more than double the Scotch born, but in 1854 the Irish born were very little ahead of the Scotch born—that is to say, there were 39,728 Irish to 36,044 Scotch. Since that period, however, the Irish born have gained numerically upon the Scotch born, the relative numbers at the last census (in 1861) being 87,160 of Irish birth to 60,701 of Scotch birth.

WELSH BORN AND FOREIGNERS.

26. The Welsh, in 1861, formed a very small portion of the population, about one per cent. only. Foreigners on the other hand were in the proportion of about eight and a half per cent. of the total population; but out of the 46,338, which was the sum total of foreigners, 24,732 were Chinese, or one in every 22 of the population. The next most numerous race were the Germans, who numbered 10,418, or one in every 52 living. The Americans numbered 2554, and the French 1250.

The following is a table of birthplaces, as returned on the 7th April, 1861:—

TABLE IV.—BIRTHPLACES OF THE PEOPLE OF VICTORIA, 1861.

Where Born.	Males.	Females.	Total Number of Persons.	Percentage.
In Australian colonies	79,725	78,186	157,911	29·23
England	108,037	61,549	169,586	31·39
Wales	4,333	1,722	6,055	1·12
Scotland	37,032	23,669	60,701	11·24
Ireland	47,176	39,984	87,160	16·14
Other British possessions	5,365	2,665	8,030	1·48
Foreign countries	43,016	3,322	46,338	8·57
Unspecified	3,967	574	4,541	0·83
Total	328,651	211,671	540,322	100·00

NOTE.—An analysis of the above shows that ten-elevenths of the Victorian population are British subjects.

OUR RISING RACE.

CHANGE OF TYPE BY PROCESS OF MARRIAGE.

27. Consequent upon the diversity of nationality existing amongst us, there is a very important change of type continually going on by process of marriage. This change, though hitherto little heeded by those effecting it, is one that will enduringly influence every social and political development of our future national life.

28. It would not be convenient here to enter at length into anything like an ethnological discussion. What is or is not a pure race, and who are members of it, are very difficult questions to answer in regard to large

sections of the British people. For, in spite of the common expressions of broad distinction in use among natives of the United Kingdom, such as "Saxon" and "Celt," the inhabitants generally of both Great Britain and Ireland cannot be truthfully arranged under such simple divisions, and assertions of purity of race are consequently apt to prove baseless when submitted to the hard pressure of historical tests. There are, however, as everybody knows, striking distinctive characteristics in the general *physique* and character of English, Irish, and Scotch people. The comers to Victoria of course brought these characteristics with them. They are the result of difference of origin, of temperament, of climate, of soil, of occupation, of social institutions, of laws, of religion, and of being kept apart.

AN AUSTRALIAN PEOPLE.

29. In this country, close proximity, as well as the consequent intimate family alliances which affection and interest are every day powerfully cementing among the living representatives in Australia of the three great peoples just named, is rapidly breaking down the old barriers to unity; and just as in the past there have been produced the English people, the Irish people, and the Scotch people, as we now see them, so will another national type be developed in the shape of an Australian people, whose destiny, I trust, it will be to show, that, as they are the latest, so will they prove the wisest, best, and happiest among the nations.

INEQUALITY IN NUMBER OF THE SEXES IN VICTORIA.

30. Equality in number of the sexes is one of the first conditions necessary for the development in a nation of its full healthy force of national growth; but there has always hitherto obtained a great disproportion in this regard in Victoria. For example, in the year 1838 there were but 14 females to every hundred males; but at the census of 1861 there were 64 females to every 100 males, and at the end of June, 1866, it was estimated that there were not less than 75 females to every 100 males, which is a smaller disproportion than has ever before existed. The greatest degree of equality naturally exists among the Victorian born. In 1861 their numbers were 69,389 males to 68,686 females, or about 99 females to every 100 males. The natives of the other Australian colonies exhibited a proportion of 92 females to 100 males. The Irish born were in the proportion of 85 females to 100 males; the Scotch in that of 64 females to 100 males; and the English in that of 57 females to 100 males.

Among foreigners the Germans showed the highest proportion of females—namely, 28 females to 100 males; and the Chinese the least—namely, one female only to every 3000 males.

NATIONALITIES OF THE MARRIED.

31. In order to determine, however, the extent to which existing national types are being fused in Victoria, it is necessary to ascertain the nationalities of the married. During the six years just prior to the census of 1861, there were upwards of twenty-six thousand marriages celebrated in Victoria; and in 25,908 instances, the nationality of both parties was specified in the register.

NATIONALITY OF PERSONS MARRIED, AND NUMBERS.

32. In the following table will be found grouped 25,908 marriages, and the numbers of English, Irish, Scotch, Welsh, Australians, Americans, Germans, Chinese, and natives of other countries of either sex, and the nationalities with which they respectively intermarried.

TABLE V.—NATIONALITY OF PERSONS MARRIED IN VICTORIA, 1855-60.

(Husbands and Wives in Combination.)

Nationality of Husbands.	Nationality of Wives.									Total Husbands.
	English.	Irish.	Scotch.	Welsh.	Australian.	American.	German.	Chinese.	Other Countries.	
English	7,152	3,065	1,457	118	644	48	40	...	140	12,664
Irish	573	4,422	270	22	176	8	5	...	31	5,507
Scotch	924	712	2,307	[illegible]	146	14	[illegible]	...	36	4,173
Welsh	155	[illegible]	52	97	[illegible]	1	...	...	2	400
Australian	197	172	80	2	148	2	3	...	4	608
American	210	214	110	10	43	15	9	...	16	627
German	178	230	65	1	28	2	375	...	36	915
Chinese	14	[illegible]	2	2	11	...	2	...	...	59
Other countries	315	308	115	6	46	6	34	...	118	948
Total wives	9,718	9,234	4,458	282	1,259	96	478	...	383	25,908

33. The next table (VI.) shows the percentage of males of the various nationalities who intermarried with females of their own or of other nationalities, and the percentage of females of the various nationalities who intermarried with males of their own or of other nationalities.

TABLE VI.—NATIONALITY OF PERSONS MARRIED IN VICTORIA, 1855-60.

(Percentage of Males and Females of each Nationality.)

Nationality of Wives.	Nationality.									Total Wives.
	English.	Irish.	Scotch.	Welsh.	Australian.	American.	German.	Chinese.	Other Countries.	
	Percentage of Husbands.									
English	56·49	10·40	22·14	37·90	32·61	33·49	19·46	23·73	33·23	37·51
Irish	24·21	80·30	17·06	20·29	28·38	34·13	25·14	47·46	32·49	35·64
Scotch	11·50	4·90	55·28	12·71	13·20	17·55	7·16	3·39	12·13	17·21
Welsh	0·93	[illegible]	0·58	23·72	0·33	1·59	0·11	3·39	0·63	1·09
Australian	5·06	3·20	3·50	4·65	24·09	6·86	3·06	18·64	4·65	4·86
American	0·38	0·15	0·34	0·24	0·33	2·39	0·22	...	[illegible]	0·37
German	0·31	0·09	0·24	...	0·50	1·44	40·98	3·39	3·59	1·84
Chinese	—	—	—	—	—	—	—	—	—	—
Other countries	1·10	0·56	0·86	0·49	0·66	2·55	3·93	...	12·45	1·48
Total	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00	100·00
Nationality of Husbands.	Percentage of Wives.									**Total Husbands.**
English	73·59	33·19	32·68	41·84	51·15	50·00	8·37	...	36·55	48·88
Irish	5·90	47·89	6·06	7·80	13·98	8·33	1·05	...	8·09	21·25
Scotch	9·51	7·71	51·75	8·51	11·60	14·59	2·09	...	9·40	16·11
Welsh	1·60	[illegible]	1·17	34·40	1·51	1·04	...	...	0·52	1·56
Australian	2·03	1·86	1·79	0·71	11·60	2·08	0·63	...	1·05	2·34
American	2·16	2·32	2·47	3·55	3·42	15·63	1·88	...	4·18	2·42
German	1·83	2·49	1·46	0·35	2·22	2·08	78·45	...	9·40	3·53
Chinese	0·14	[illegible]	0·04	0·71	[illegible]	...	0·42	...	...	0·23
Other countries	3·24	3·34	2·58	2·13	3·65	6·25	7·11	...	30·81	3·66
Total	100·00	100·00	100·00	100·00	100·00	100·00	100·00	...	100·00	100·00

34. Tables V. and VI. should be read in connection with each other, by which means the following results, amongst others, are arrived at:—Out of 25,908 males who married in Victoria during the six years ending 30th June, 1860, 12,664 were Englishmen, of whom 7152, or 56½ per cent., married with English women. On the other hand, out of 25,908 women who married in the same six years, 9718, or 37½ per cent., were English, and of these 7152, or nearly 74 per cent., married with English men. Again, as many as 3065, or nearly 10½ per cent. of the Englishmen, married Irish women; in striking contrast to which only 573, or less than six per cent., of the English women married Irish men. During the same six years, 4422 Irish men married the same number of Irish women, the former being 80 per cent. of the Irishmen, and the latter 48 per cent. of the Irish women who married. Of 59 Chinese (all males) who married, 28, or 47½ per cent., married Irish women; half that number, or 23¾ per cent., married English women; 11, or 18⅔ per cent., married Australian born women; 2, or 3⅖ per cent., married Scotch women; and the same number and percentage married Welsh women and German women.

35. In like manner, the number of persons of either sex and of any nationality, together with the nationality with which they respectively intermarried, will be found in the first table, as may also be found the proportions per cent. of those who married to the respective nationalities of those with whom they intermarried, in the second.

36. In the next table, the percentage of the various intermarriages to the whole number of marriages is given, or the number of each combination to every 100 marriages solemnised.

TABLE VII.—NATIONALITY OF PERSONS MARRIED IN VICTORIA.—1855-1860.

(Proportion of each combination to the whole.)

NATIONALITY OF HUSBANDS.	NATIONALITY OF WIVES.									Total Husbands.
	English.	Irish.	Scotch.	Welsh.	Australian.	American.	German.	Chinese.	Other Countries.	
	Pr. cent.	Pr. cent.	Pr. cent.	Pr. cent.	Pr. cent.	Pr. cent.	Pr. cent.	Pr. cent.	Pr. cent.	Per cent.
English	27·605	11·836	5·634	0·456	2·486	0·185	0·154	...	0·541	48·881
Irish	2·212	17·068	1·042	0·085	0·679	0·031	0·019	...	0·120	21·256
Scotch	3·567	2·748	8·304	0·092	0·564	0· 54	0·039	...	0·139	16·107
Welsh	0·598	0·320	0·201	0·374	0·074	0·004	...	...	0·007	1·578
Australian	0·760	0·664	0·309	0·008	0·563	0·008	0·012	...	0·015	2·339
American	0·811	0·826	0·424	0·038	0·166	0·056	0·036	...	0·062	2·420
German	0·687	0·848	0·251	0·004	0·108	0·006	1·447	...	0·139	3·532
Chinese	0·054	0·108	0·008	0·008	0·042	...	0·008	...	...	0·228
Other Countries ...	1·216	1·189	0·444	0·023	0·178	0·023	0·131	...	0·455	3·669
Total wives ...	37·5 10	35·641	17·207	1·088	4·860	0·371	1·845	...	1·478	100·000

37. Thus, out of every 100 men who married, 49 were English; out of every 100 women, 37½ were English. Out of every 100 marriages which took place, 27·6 were between English males and English females; 17·1 were between Irish males and Irish females; 11·8 were between English males and Irish females; 2·2 were between Irish males and English females and so on for all the other combinations.

38. Supposing unity of race and unity of nationality were synonymous, the grouping of the 25,908 marriages, as effected in the following table, would indicate how far such unity was being sustained by the alliances in question.

TABLE VIII.—NATIONALITY OF PERSONS MARRIED, 1855-1860.

(Nation with same Nation.)

MALES AND FEMALES.	No. of Marriages.	Percentage to total number of Marriages.
English with English	7,152	27·60
Irish with Irish	4,422	17·07
Scotch with Scotch	2,307	8·90
Welsh with Welsh	97	0·37
Australian with Australian	146	0·56
American with American	15	0·06
German with German	375	1·45
Other countries with same countries	118	0·46
Total number of marriages of one nationality with same nationality	14,632	56·47
Other marriages	11,276	43·53
Total	25,908	100·00

39. Here it is shown that of the total marriages, 7152, or 27·6 per cent., were between English and English; 4422, or 17·0 per cent., between Irish and Irish; and 2307, or 9·0 per cent. (nearly), between Scotch and Scotch. Showing that the distinction of race or nationality was, over the six years in question, preserved among little more than half of the total marriages.

40. At some future date I may carry these investigations further. As the marriages of Australian born gradually assume numerical importance, it will become more and more difficult to distinguish the national origin of any given portion of the Victorian people, and hence I have thought it well to open up the matter here.

CONJUGAL CONDITION.

41. The following table shows the conjugal condition of the people of Victoria, of 15 years old and upwards, when the census was taken, the Chinese and aborigines being omitted.

TABLE IX.—CONJUGAL CONDITION ON THE 7TH APRIL, 1861.

OF 15 YEARS AND UPWARDS.	Persons.	Males.	Females.
Married	173,380	88,837	84,543
Unmarried	143,467	113,350	30,117
Widowed	13,456	6,834	6,622
Unspecified	2,213	1,947	266
Total	332,516	210,968	121,548

EARLY MARRIAGES.

42. Under the age of fifteen, three boys were returned as husbands, seven girls as wives, and one as a widow. Between fifteen and twenty, 69 youths were returned as husbands, and 5 as widowers; at the same age, 2077 females were returned as wives, and 25 as widows.

HUSBANDS AND WIVES.

43. Of the whole population, one in three was living in the married state; of every 1000 males of all ages, 298 were husbands; of every 1000 females, 402 were wives.

44. The proportion of husbands in every 1000 males of the age of fifteen and upwards was 425; the proportion of wives in every 1000 females at the same age, was 697. Of males of 20 and upwards, 458; and of females of 20 and upwards, 784 in every 1000 were married.

WIDOWERS AND WIDOWS.

45. Assuming each wife to represent a family, there were in Victoria, when the census was taken, 84,550 integral families; but there were also 13,457 families in a state of dissolution, namely, 6623 by the death of the husband at their head, and 6834 by the death of the wife at their head, the former being the number of widows, and the latter the number of widowers returned.

46. The proportion of widowers to the male population was one in 44; that of widows to the female population was one in 32. The husbands were to the widowers in the proportion of 13 to 1; the wives to the widows were also in the proportion of 13 to 1. Of men of the age of 20 and upwards, one in 28 was a widower; of women at the same age, one in sixteen was a widow.

BACHELORS AND SPINSTERS.

47. If unmarried persons of the age of fifteen and upwards are to be termed bachelors and spinsters, Victoria contained, when the census was taken, 113,350 of the former and 30,117 of the latter, or 376 bachelors to 100 spinsters. If this designation be not used until the parties have attained the age of 20, the numbers would be 98,198 bachelors and 16,128 spinsters. If 20 and upwards for males, and 15 and upwards for females, be considered the marriageable ages, then the proportions would be 326 bachelors to 100 spinsters.

48. Unmarried males at the age of fifteen and upwards were in the proportion of 542 in every 1000 males of the same age; unmarried females of fifteen and upwards were in the proportion of 248 in every 1000 females at that age. At the age of 20 and upwards, bachelors amounted to 507 in every 1000 of the male population; at the same age, unmarried females amounted to 153 in 1000 of the female population.

NUMBER OF INHABITANTS TO THE SQUARE MILE.

49. The number of inhabitants to the square mile in Victoria at the date of the census in 1861 was 6·2. There is now in 1866 an additional unit, or rather more than seven persons to the square mile. In New South Wales, in 1861, there was rather more than one person to each square mile, and in South Australia but four-tenths of a person to each square mile.* In England and Wales, according to last census, there were about 344 persons on the average to each square mile. This allows less than 2 acres for each individual in England and Wales, whilst taking the whole of Victoria there is a space of nearly 88 acres for each person.

50. Of course the population is not everywhere of equal density. While the large towns and goldfields are, comparatively speaking, thickly peopled, the pastoral districts are very sparsely so, and beyond these large tracts of country are even yet not fully explored. The south-western portion of the colony is divided into counties, but the remaining portion, termed "the unsettled districts," has not yet been subdivided. The counties number sixteen,† and cover 23,990 square miles, or less than a third of the area of the colony. These contained 400,790 inhabitants when the census was taken in 1861, or not far short of three-fourths of the total population—the ratio to the square mile being 17 persons. Of the unsettled districts there are five,‡ embracing 62,841 square miles, or upwards of two-thirds of the colony; in these there were only 134,253 persons, or a little more than a fourth of the population, the proportion being only two persons to the square mile. Taking these counties and districts separately, the most thickly peopled is *Bourke*, the metropolitan county, with 109 persons to the square mile; next comes *Talbot*, containing the Castlemaine, Daylesford, Maryborough, and other important goldfields, with 55 persons to the square mile; then *Grant*, in which Geelong and a portion of the Ballarat goldfields are situated, with 39 persons to the square mile; then *Grenville*, containing the principal portion of the Ballarat as well as several other goldfields, with 21 persons to the square mile; then *Dalhousie*, an important agricultural county, containing the towns of Kilmore, Kyneton, and Heathcote, with 17 persons to the square mile; then *Villiers*, a fine agricultural county on the coast, possessing the seaports of Belfast and Warrnambool, with 8 persons to the square mile; then *Ripon*, having an agricultural population at its eastern extremity and extensive goldfields in other parts of it, with 5 persons to the square mile; then *Normanby*, a coast county containing the seaport of Portland, but having for the most part only poor or thickly-

* The following calculation has been made from the *data* afforded in the census return of the two colonies in question, in 1861:—

New South Wales—590 acres to every person; area, 323,437 square miles. 1·085 persons to every square mile; population, 350,860.

South Australia—1577 acres to every person; area, 312,500 square miles. ·406 persons to the square mile; population, 126,830.

† Their names are Anglesey, Bourke, Dalhousie, Dundas, Evelyn, Follet, Grant, Grenville, Hampden, Heytesbury, Mornington, Normanby, Polwarth, Ripon, Talbot, Villiers.

‡ Their names are Gippsland, the Loddon, the Murray, Rodney, the Wimmera.

timbered land, with 4 persons to the square mile; then *Evelyn*, with 3½ persons to the square mile; *Mornington*, the *Murray*, and *Hampden*, each with less than 3 persons to the square mile; *Rodney*, *Dundas*, and *Polwarth*, with less than 2 persons to the square mile; the *Wimmera*, with 1 person to the square mile; *Anglesey*, *Follett*, *Heytesbury*, and *Gippsland*, with less than 1. The last-named district had only four-tenths of a person to a square mile when the census was taken; since then, however, gold discoveries have been made within its limits, and its population has consequently considerably increased.

HOUSES.

51. The number of inhabited houses in Victoria was ascertained in 1861 to be 128,617. The average number of persons to a house was thus 4·2, or 42 persons to 10 houses. This proportion was the same as at the previous census, and it is probable that it still obtains. The present number of houses in the colony may therefore be estimated at about 150,000.

52. Besides the inhabited houses just mentioned, there were 5017 houses untenanted, 119 in the course of erection, and 579 stores, offices, and public institutions used during the daytime, but with no one sleeping in them upon the census night. The total number of edifices of all descriptions was 134,332. The materials were thus returned:—Houses of brick or stone, 18,990; houses of wood, iron, or lath and plaster, 59,346; tents and dwellings with canvas roofs, 42,750; huts made of bark, slabs, or mud, 9280; and buildings of materials not specified, 3966. The classification as to number of rooms showed the following results:—7517 houses had more than 6 rooms, 9772 had 5 or 6 rooms, 34,817 had 3 or 4 rooms, 34,509 had two rooms, and 40,162 had only 1 room.

53. The number of houses to the square mile when the census was taken in 1861, was 1·482, or nearly 3 houses to 2 miles. Should the houses have increased in the same ratio as the population, the proportion would now be about 1·718 houses to the square mile, or rather more than 5 houses to 3 miles. In England and Wales, according to the census of 1851, there were on the average 64 dwellings to the square mile. In New South Wales there was but ·177 of a house to the square mile, with over 6 persons to each house; while in South Australia there was ·089 of a house only to each square mile, with 5·1 persons to each house.

54. The most populous town in Victoria is Melbourne, the metropolis. It also has a larger number of inhabitants than any other city in Australia. When the census was taken, it contained 126,536 souls. All these, however, were not within the corporate limits, but were embraced in fourteen municipalities, and several unmunicipalised townships, the whole situated within a radius of 8 miles. The second town in Victoria in 1861 was Geelong, consisting of three municipalities, and having in all 22,986 inhabitants. Next in order ranked Ballarat, consisting of two municipalities, with 22,104 inhabitants; but there is reason to believe that in the present year (1866) Ballarat should be ranked second and Geelong third in the list of Victorian towns. Next comes Sandhurst, with 13,020 individuals; then Castlemaine, with 9683; and next Creswick, with 4714.

PRINCIPAL TOWNS.

55. The following is a list of some of the principal towns in Victoria, arranged alphabetically together, with their population at the last census. Those marked thus* are suburbs of Melbourne. Those marked thus† are suburbs of Geelong :—

	Population.		Population.
Amherst	2,080	Heathcote	1,003
Ararat	1,476	*Hotham	7,053
Ballarat East	12,840	Inglewood	2,845
Ballarat West	9,264	*Kew	1,439
Beaufort	1,216	Kilmore	1,668
Belfast	2,342	Kyneton	2,094
Beechworth	2,317	Lethbridge	1,267
*Brighton	2,501	Maldon	3,334
*Brunswick	3,014	Maryborough	2,495
Buninyong	1,206	Melbourne (exclusive of Suburbs)	36,868
Castlemaine	9,683	†Newtown and Chilwell	4,901
Chewton	3,353	*Pentridge	1,033
Chiltern	1,100	Portland	2,804
Clunes	1,711	*Prahran	9,866
*Collingwood East	12,653	*Richmond	11,355
Creswick	4,714	Rutherglen	1,136
Daylesford	1,919	Sandhurst	13,020
*Emerald Hill	8,822	*Sandridge	3,351
*Fitzroy	11,807	Smythesdale	1,794
*Flemington	1,291	†South Barwon	1,472
*Footscray	1,070	*St. Kilda	6,408
Geelong (exclusive of Suburbs)	16,613	Warrnambool	2,211
Hamilton	1,197	*Williamstown	4,492
*Hawthorn	2,342		

ABORIGINES.

56. When Port Phillip was first settled, is is believed that the aborigines numbered about 5000. According to official returns made in the year of separation from New South Wales (1851), this number had become reduced to 2693. An attempt was made to take an account of their numbers at the census of 1857, and subsequently at that of 1861. The result was 1768 at the former, and 1694 at the latter date. It is not pretended, however, that all were enumerated on either occasion. The returns from the Central Board for the protection of the aborigines testified to the ascertained existence of 1860 in different parts of the colony in August, 1861, or four months after the date of the last census, and that number was believed by the members of the Board to be rather under than over the mark. By a still later return, made by the same Board, the aborigines in the colony amounted, on the 25th September, 1863, to 1908. It is satisfactory to learn that, though their numbers decreased rapidly in the early years of the colony, they are not now diminishing to any serious extent. This improvement is no doubt owing, in a great measure, to the efforts of the Central Board, who receive and expend an annual sum voted by Parliament expressly for the aborigines. Those who are in want can always obtain food and clothing at fixed stations, and the sick are in like manner provided with medical attendance and medical comforts.

57. According to the last annual report of the Board, the amount placed on the estimates for 1865, for expenses connected with the aborigines, was £7000, and the sum expended during the year ending

31st July, 1865, was £5924 4s. The following stores were distributed amongst them during the same financial year :—

Flour	108,610 lbs.	Serge Shirts	548
Tea	2,991¾ ,,	Twill Shirts	464
Sugar	28,617 ,,	Trousers	790 pairs
Tobacco	1,983½ ,,	Jumpers (boys')	183
Rice	3,024 ,,	Dresses	479
Oatmeal	450 ,,	Petticoats	424
Soap	3,181 ,,	Chemises	111
Meat	787 ,,	Tomahawks	142
Blankets	1,175 pairs	Pint and Quart Pots	280

Also salt, medicines, medical comforts, pipes, fish hooks, thread, twine, needles, calico, and implements.

AGES OF THE POPULATION.

58. The average age of the people of both sexes in Victoria, when the census was taken, was about 23 years and 7 months ; that of males was about 25 years and 5 months, and that of females 20 years and nearly 6 months. The average age of males therefore exceeded that of females by 5 years. In England, the mean age of males is 26 years, and therefore does not differ much from that of males in Victoria ; but the average of females in England is ten months in excess of that of males, instead of being about five years less, as in Victoria.

59. The following table gives the census return of the ages of the people of Victoria in quinquennial periods :—

TABLE X.—AGES, 1861.

Ages.	Persons.	Males.	Females.
All ages	540,322	328,651	211,671
Specified ages	534,863	323,863	211,000
From 0 to 5	91,366	45,989	45,377
,, 5 ,, 10	53,180	26,458	26,722
,, 10 ,, 15	34,479	17,411	17,068
,, 15 ,, 20	32,718	16,525	16,193
,, 20 ,, 25	55,396	32,865	22,531
,, 25 ,, 30	79,903	53,196	26,707
,, 30 ,, 35	68,265	48,260	20,005
,, 35 ,, 40	43,379	30,271	13,108
,, 40 ,, 45	31,796	22,319	9,477
,, 45 ,, 50	17,496	12,296	5,200
,, 50 ,, 55	12,864	8,883	3,981
,, 55 ,, 60	6,072	4,114	1,958
,, 60 ,, 65	4,727	3,157	1,570
,, 65 ,, 70	1,693	1,120	573
,, 70 ,, 75	934	595	339
,, 75 ,, 80	351	233	118
,, 80 and upwards	244	171	73
Unspecified	5,459	4,788	671

AGES IN VICTORIA, NEW SOUTH WALES, AND SOUTH AUSTRALIA COMPARED.

60. Censuses of the adjacent colonies of New South Wales and South Australia were taken simultaneously with that of Victoria. Hence a comparison is easily made between the physical strength of the populations of the three colonies. The following figures show that the population of Victoria has only 3553 persons under 15 and over 65 in 10,000 of all ages, against 3928 in New South Wales and 4453 in South Australia, thereby showing for Victoria a smaller ratio of the physically-dependent classes

than for either of the adjacent colonies, and this notwithstanding the Chinese in Victoria are eliminated from the calculation. The Chinese numbered 24,732, and were nearly all adult males. These, if included, would therefore add considerably to the numerical proportion of physical strength in our community :—

	Victoria.	N. S. Wales.	South Australia.
Under 15	3,494	3,797	4,374
15 to 65	6,447	6,072	5,547
65 and upwards	59	131	79
	10,000	10,000	10,000

Ages in Great Britain and Victoria Compared.

61. It has been assumed in Great Britain that the population under 10 years of age and over 70 are sustained by the exertions of those between 20 and 60, whilst persons between the ages of 10 and 20 and between 60 and 70, as a rule, support themselves, but are not able to contribute to the sustenance of others. By a calculation based upon this supposition, it is found that in the United Kingdom the persons at the supporting period of life are charged with the sustenance of a class amounting to 57 per cent. of their own numbers. When the census of Victoria was taken in 1854, the aged and the young amounted to only 32 per cent. of those at the middle period of life. In 1857, the former had increased to 38 per cent. of the latter, and in 1861 to 50 per cent., thus showing at each successive census a nearer approach in this respect to the standard of Great Britain.

62. If the persons under 20 and over 60 are considered as the dependent classes, a wide difference is found to exist between Great Britain and Victoria, as will be seen by the following figures :—

	Great Britain.	Victoria.
Numbers under 20 and over 60 in every 1000 living	523	426
Numbers between 20 and 60 in every 1000 living	477	574

63. The ages of males and females in Great Britain and Victoria are compared in the following table, by which it is seen that the males between 20 and 40, or at what is technically termed the soldier's age, are only 307 in every 1000 of all ages in the former, against 487 in every 1000 of the latter; and that females, from infancy to 40 years of age, or at and below the fruitful or child-bearing period, are as 753 in Great Britain to 889 in Victoria.

Table XI.—Ages of Males and Females.—Great Britain and Victoria Compared.

Ages.	Males.		Females.	
	Great Britain.	Victoria.	Great Britain.	Victoria.
Under 20 years	461	349	441	499
20 to 40	307	487	312	390
40 to 60	165	147	168	98
60 to 80	62	16	71	12
80 and upwards	5	1	7	1
	1000	1000	999	1000

20

OCCUPATIONS.

64. The occupations of the people of Victoria, at the three last censuses, have been carefully classified upon the English system, slightly modified to suit our local circumstances. The following are the proportions of the different classes at the three periods :—

Table XII.—Occupations, 1854–1861.

Classes.	Proportions per Cent.		
	1854.	1857.	1861.
Governmental, Professional, and Trading Classes	8·68	5·58	5·20
Manufacturing and Labouring Classes	14·07	11·33	10·42
Gold Mining Class	15·35	20·07	15·38
Pastoral and Agricultural Classes	6·11	9·01	9·77
Personal Offices, Domestic Servants, &c............	9·00	9·27	9·04
Miscellaneous, including Women and Children...	46·79	44·74	50·19
Total	100·00	100·00	100·00

65. The occupations of males and females, as ascertained at the census of 1861, will be found in the following table, grouped upon a more extended scale than the above :—

Table XIII.—Occupations of Males and Females, 1861.

Occupations.	Males.		Females.	
	Number.	Proportions per cent.	Number.	Proportions per cent.
Ministering to Government............................	3,746	1·14	28	·01
Ministering to Religion	477	·15	13	·01
Ministering to Health	1,184	·36	498	·23
Ministering to Law	918	·28	—	—
Ministering to Education	1,093	·33	1,684	·80
Ministering to Art, Science, and Literature	1,336	·41	143	·07
Traders	7,175	2·18	1,448	·68
Assisting in the exchange of Money and Commodities	6,634	2·02	337	·16
Ministering to Entertaining and Clothing	7,253	2·21	5,494	2·60
Domestic Servants..	4,899	1·49	18,796	8·88
Contractors	467	·14	1	—
Artisans and Mechanics	33,089	10·07	223	·10
Gold Miners	81,747	24·87	143	·07
Engaged in pursuits subsidiary to Gold Mining..	1,226	·37	—	—
Engaged in Pastoral pursuits..........................	9,080	2·76	644	·30
Engaged in Agriculture	34,738	10·57	6,480	3·06
Engaged in pursuits subsidiary to Grazing and Agriculture	1,846	·56	13	·01
Engaged in Land Carriage	9,708	2·95	47	·02
Engaged in Sea Navigation............................	2,481	·75	9	·01
Dealing in Food..	11,104	3·38	1,276	·60
Labourers	10,221	3·11	23	·01
Engaged in Unclassified pursuits	977	·30	79	·04
Persons of independent means	1,013	·31	350	·16
Wives, Widows, Children, Relatives, &c.	52,580	16·00	140.871	66·55
Scholars	31,132	9·47	29,924	14·14
Public burden	3,511	1·07	1,048	·49
Unemployed, unspecified...............................	6,998	2·13	1,939	·92
Unemployed through infirmity	1,988	·61	160	·08
Total...	328,651	100·00	211,671	100·00

66. A return of the persons employed upon farms and squatting stations has recently been made up in this department, to the 31st March, 1866. The following is the result:—

	Males.	Females.
Hands employed on Farms	33,147	12,869
„ Stations	6,799	2,336
Total	39,946	15,205

67. According to an estimate made in the mining department, the number of gold miners at the end of 1865 was 79,457, of whom 62,131 were engaged in alluvial, and 17,326 in quartz mining. This estimate shows a reduction of 2290 miners upon the number enumerated in 1861.

68. With these exceptions, there are no data for ascertaining what changes have taken place in the occupations of the people of Victoria since the census was taken in 1861.

RELIGIONS.

69. The following table gives a summary of the religions professed by the people of Victoria at the date of the census:—

TABLE XIV.—RELIGIONS, 1861.

Religious Denominations.	Males.	Females.	Persons.	Proportion per cent.
Church of England	127,958	84,110	212,068	39·25
Presbyterians	50,984	36,119	87,103	16·12
Wesleyans	25,557	20,954	46,511	8·61
Independents	7,069	5,708	12,777	2·36
Baptists	4,989	4,012	9,001	1·67
Lutherans	7,620	2,423	10,043	1·86
Unitarians	989	441	1,430	·26
Society of Friends	192	81	273	·05
Calvinists, or Calvinistic Methodists	492	158	650	·12
Other Protestants	792	465	1,257	·23
Roman Catholics	59,732	50,097	109,829	20·33
Greek Church	226	13	239	·04
Israelites	222	173	395	·07
Mormons	90	18	108	·02
Jews	1,857	1,046	2,903	·54
No Denomination	761	191	952	·18
No Religion	398	43	441	·08
Mahomedans	178	11	189	·04
Pagans (including Chinese)	25,582	641	26,223	4·85
Objecting to state their religion from conscientious scruples	7,607	3,929	11,536	2·14
Unspecified	5,356	1,038	6,394	1·18
Total	328,651	211,671	540,322	100·00

70. Taking all the Protestant sects, the number of persons claiming to be Protestants numbered 381,113, or about seven-tenths of the population. The Roman Catholics amounted to about a fifth of the inhabitants. There was about 1 Jew to every 186 persons living, and the residue, embracing all other sects, those of no religion, and those whose religions were not specified, amounted to rather less than a twelfth of the population.

71. The number of Chinese professing Christianity was 181, out of a total of 24,732, or about 1 in 137. The Aborigines who professed to be Christians numbered 12, or 1 in 141.

IMMIGRATION AND EMIGRATION.

72. From the first settlement of the colony to the end of 1865, 832,871 persons are recorded as having arrived, and 421,498 persons as having left

the country. This leaves an excess of arrivals over departures equal to 411,373 souls.

73. The following return shows the numbers of persons of both sexes who arrived and departed by sea during 30 years. The largest immigration took place in 1852, and the largest emigration in 1853. The total departures exceeded the total arrivals in 1861 and 1862. The departures of males exceeded the arrivals of males not only in those two years, but also in 1863. The arrivals of females were in each year uniformly in excess of the departures of females.

TABLE XV.—SHOWING TOTAL NUMBER OF IMMIGRANTS AND EMIGRANTS FROM 1835–65, BOTH INCLUSIVE.

Year.	Immigration.			Emigration.		
	Males.	Females.	Persons	Males	Females.	Persons.
1836 } 1855 }	307,230	120,989	428,219	130,203	26,479	156,682
1856	28,335	13,259	41,594	17,362	3,825	21,187
1857	51,951	22,304	74,255	16,752	3,719	20,471
1858	43,006	13,162	56,168	21,691	4,191	25,882
1859	21,961	10,774	32,735	15,349	4,266	19,615
1860	19,566	9,471	29,037	17,220	4,469	21,689
1861	18,491	8,421	26,912	30,914	4,984	35,898
1862	28,434	9,402	37,836	31,043	7,160	38,203
1863	26,141	12,842	38,983	27,929	6,871	34,800
1864	25,427	10,729	36,156	15,758	6,021	21,779
1865	21,234	9,742	30,976	19,105	6,187	25,292
Totals...	591,776	241,095	832,871	343,326	78,172	421,498

74. Among the varied inducements held out to the inhabitants of the United Kingdom for emigration to Victoria has been the practice of our Legislature in granting aid to certain classes of immigrants, by defraying either wholly or in part their cost of transit from Europe to Australia. The total number of immigrants assisted from 1838 to the end of 1865 was 144,362, of whom 58,434 were males, and 85,928 were females; the reduction of the disproportion existing among our population being one of the objects proposed by the Government in dispensing its bounty.

75. The following table furnishes the number of assisted immigrants of both sexes from the year 1838, the experience of the last ten years being set forth year by year :—

TABLE XVI.—ASSISTED IMMIGRATION, 1838–1865.

Year.	Number of Immigrants Introduced.		
	Males.	Females.	Persons.
1838 } 1855 }	37,887	48,914	86,801
1856	1,763	2,916	4,679
1857	5,429	8,940	14,369
1858	2,320	3,539	5,859
1859	552	2,599	3,151
1860	185	1,551	1,736
1861	747	1,935	2,682
1862	1,710	3,018	4,728
1863	3,213	5,409	8,622
1864	2,673	3,958	6,631
1865	1,955	3,149	5,104
Total	58,434	85,928	144,362

76. The sum of £1,765,835 15s. 2d. has been expended by the colony upon the introduction of immigrants, from the year of its separation from New South Wales, 1851, to the end of 1865. The number introduced during the period, according to the last table, was 144,362. The cost per head was therefore £12 4s. 7¾d.

BIRTHS, MARRIAGES, AND DEATHS.

77. During the decennial period, 1856-1865, the total number of births registered in Victoria was 220,041, and that of deaths 93,174. The gain to the population by natural increase has therefore been 126,867 in the last ten years. In the year 1865 the births numbered 25,915, and the deaths 10,461. The excess of the former over the latter in that year was therefore 15,454.

78. The number of marriages in 1865 was 4497. Of these 3646 were between bachelors and spinsters; 348 between bachelors and widows; 341 between widowers and spinsters; and 162 between widowers and widows. Of the men 55, and of the women 1191, had not attained the full age of 21.

79. The number of births, deaths, and marriages in every thousand of the living population during each of the last ten years, together with the mean of the whole decennial period, were as follow:—

TABLE XVII.—PROPORTION OF BIRTHS, MARRIAGES, AND DEATHS TO THE LIVING POPULATION, 1856–65.

Year.	Numbers to every Thousand of the Population.		
	Births.	Marriages.	Deaths.
1856	37·85	10·71	15·04
1857	40·40	10·51	17·31
1858	41·19	9·41	18·63
1859	42·71	9·22	18·31
1860	42·39	9·07	22·36
1861	43·37	8·20	19·45
1862	44·50	8·26	18·39
1863	42·58	7·53	16·91
1864	43·59	7·73	15·08
1865	42·04	7·29	16·97
Mean of Ten Years	42·06	8·79	17·84

NOTE.—Some of the figures for the years from 1856 to 1860, as shown in the above table, differ by fractions from those given in Table III. of my "Statistical Sketch" of the Colony, published with the *Catalogue of the Victorian Exhibition of* 1861. This is in consequence of the calculations in that sketch having been made upon the births, deaths, and marriages which took place in the year ending 30th June, whereas the above were for the ordinary year ending 31st December.

80. According to European returns for the year 1863, which are the latest to hand, the birth, marriage, and death rates in four of the principal European countries were as follow:—

TABLE XVIII.—PROPORTION OF BIRTHS, MARRIAGES, AND DEATHS TO EVERY THOUSAND OF THE LIVING POPULATION IN FOUR EUROPEAN COUNTRIES, 1863.

Countries.	Numbers to every Thousand of the Population.		
	Births.	Marriages.	Deaths.
England	35·39	8·44	23·05
France	26·86	8·00	22·44
Austria	39 88	8·67	31·10
Italy	39·12	8·13	31·15

81. It thus appears that the birth and death rates in Victoria are more favourable, the one being much higher and the other considerably lower than in any of the countries named; also that the mean marriage rate over the whole decennial period is higher, but for the last few years has been lower in Victoria than in those countries. These comparisons result from tables of births, marriages, and deaths of the various countries, in connection witn their respective populations. The absolute value of such comparisons, however, depends upon the similarity of the proportions of persons at any age to the total population in each country.

COMPARATIVE MORTALITY PER CENT. AT EACH CENSUS FROM 1841 TO 1861.

82. The total recorded mortality in 1841 was 319 out of 15,353 persons living during that year in the Port Phillip district, and the mortality was therefore at the rate of a little over 2 per cent. At this period upwards of 70 per cent. of the population consisted of adults.

83. In 1846 there were recorded 328 deaths out of 34,807 living, which was less than one per cent. of mortality, notwithstanding the percentage of adult population from 21 to 60 had decreased to less than 60 per cent., and the proportion of children under 5 had increased from 13 per cent. of the total population in 1841, to upwards of 25 per cent. in 1846. Either this was a year of remarkable healthiness, or some defect existed in the machinery of registration.*

84. In 1851 the number of deaths recorded was 1165 out of 86,825 living during the year, or 1·342 per cent., a marked increase on the mortality recorded as having obtained in 1846.

85. But it was in 1854 that the highest rate of mortality is observable, and the immense influx of adults attracted by the richness of our goldfields brought the percentage of people living between 21 and 60 to 62 per cent. of the population; the children under 5 years forming only about 15 per cent. of the total living. Notwithstanding this, however, the mortality recorded in that year was 2·342 per cent. This was doubtless consequent upon the hardships endured by the miners, combined with the habits of dissipation too common among all classes at that period of universal gold-getting.

86. In 1857 the deaths recorded were 7449 out of 430,347 living, or 1·73 per cent.

87. And at the last census (1861) there were 10,522 deaths out of 541,025 living, or not quite 2 per cent.; the proportion of children under 5 at that time being 22 per cent. of the total population, and the percentage of adults between 15 and 60 being 57 per cent.

* The present system of registration was introduced in the year 1853.

88. Since that time, according to a calculation of the recorded deaths in connection with the estimated population, there has been a further declension in the rate of mortality.

MORTALITY IN THE SEVERAL MONTHS OF THE YEAR.

89. Among males at all ages, from observations made over a period of five years, the months of greatest mortality were in the following order, commencing at the highest as to deaths:—1 March, 2 January, 3 April, 4 February. Among females, at all ages, over the same period, the months of greatest mortality were:—1 March, 2 January, 3 February, 4 April, being identical with the experience of males, except in regard to the order of February and April.

90. Among males, at all ages, over the same period, the months of least mortality were, commencing with the highest as to healthiness:—1 October, 2 November, 3 July, 4 August. Among females, at all ages, the months of least mortality were:—1 October, 2 August, 3 November, 4 June.

91. With respect to infants under one year, the months of highest mortality are found to be, both among male and female children:—1 January, 2 March, 3 February, 4 December. The months of least mortality among both male and female infants are:—1 October, 2 September, 3 June, 4 August.

92. In regard to adults from the age of 20 to 45, over the same number of years, the months of highest mortality were:—1 March, 2 April, 3 May, both for males and females; and the months of least mortality for males were:—1 November, 2 October, 3 July, 4 February; and for females, 1 August, 2 November, 3 October, 4 January.

93. These results, of course, vary somewhat in different years; but taken in connection with the chronological tables, there is sufficient indication of peculiar general laws, both of sickness and mortality, affecting different ages at different seasons of the year. These laws will, sooner or later, doubtless obtain a full investigation and illustration at the hands of the medical profession.

94. The number of deaths in Victoria occurring in each month, out of every thousand deaths during the year, are given in the following table, which shows an average extending over a period of ten years:—

TABLE XIX.—PROPORTION OF DEATHS IN EACH MONTH.

MONTHS.	Deaths in each Month in every thousand during the Year (Mean of Ten Years).
January	109·78
February	97·67
March	113·11
April	96·72
May	82·65
June	73·76
July	72·39
August	67·61
September	67·41
October	63·05
November	64·56
December	91·29
Total	1000·00
Monthly Average	83·33

95. According to these figures, the months of greatest mortality in Victoria are March and January; those of the least mortality are October and November. The mortality in the seven months from May to November inclusive is below the monthly average, and that in the remaining five months is above that average.

Ages at Death in Victoria, England, and France Compared.

96. The number of deaths of males and females at different periods of age in every thousand living at the same periods, is given in the following table for the year of the last census, and is compared with the average number of deaths to every thousand living at the same age periods, occurring in England and France over a series of years.

Table XX.—Deaths in every Thousand Living at each Age. Victoria, France, and England Compared.

Age.	Number of Deaths to every Thousand Living.					
	Males.			Females.		
	Victoria, Year 1861.	England and Wales. Mean of Ten Years.	France, Mean of Ten Years.	Victoria. Year 1861.	England and Wales. Mean of Ten Years.	France. Mean of Ten Years.
All Ages	18·75	23·38	23·80	20·82	21·80	23·19
Under 5 Years	67·73	72·24	84·55	62·32	61·87	75·45
5 to 10 Years	14·51	9·48	10·49	13·13	9·41	11·04
10 to 15 „	4·19	5·20	5·36	4·68	5·39	6·41
15 to 25 „	5·95	8·34	10·34	5·11	8·62	8·41
25 to 35 „	7·85	10·09	10·02	8·84	10·67	9·69
35 to 45 „	12·43	12·92	10·96	11·73	12·91	11·03
45 to 55 „	19·31	18·49	14·76	13·72	16·05	44·38
55 to 65 „	30·39	32·05	29·19	23·81	23·67	27·27
65 to 75 „	47·23	63·05	60·69	35·08	61·33	63·49
75 Years and upwards	116·33	158·97	160·22	94·24	141·06	153·76

97. It appears from these figures that the rate of mortality of both males and females is lower in this colony than in either of the countries named; that, contrary to the popular opinion, the death rate of children under five is even lower here than in those countries; and that from five years old to ten is the only period of life at which the rate is much higher in Victoria than in either England or France. This is a matter that merits thorough investigation.

Causes of Death in Victoria and England Compared.

98. The number of deaths from each class of diseases in a thousand, from all causes, in Victoria and England, are compared in the following table. The average extends over ten years for Victoria, and eight years for England.

TABLE XXI.—DEATHS IN VICTORIA AND ENGLAND FROM EACH CLASS OF DISEASES.

Class.	Number of Deaths in every Thousand from All Causes.	
	Victoria.	England.
Zymotic Diseases	307·42	241·12
Constitutional Diseases	130·10	213·62
Local Diseases	308 99	363·43
Developmental Diseases	154·27	146·23
Violent Deaths	99·22	35·60
Total	1000·00	1000·00

99. The proportion of deaths from diseases of the zymotic type is greater in Victoria than in England, as also is that from developmental diseases and from violence. But the proportion from constitutional diseases, of which phthisis or consumption is the most fatal, and also from local diseases, which include those which have their seat in particular organs, is greater in England than in Victoria.

.100. The number of deaths of persons of all ages from the different classes of diseases to every thousand deaths from all causes, during each of the last ten years, will be found in the following table :—

TABLE XXII.—DEATHS FROM EACH CLASS OF DISEASES.—PROPORTION TO THE DEATHS FROM ALL CAUSES, 1856–1865.

Years.	Number of Deaths in 1000 from All Causes, from				
	CLASS I. Zymotic Diseases.	CLASS II. Constitutional Diseases.	CLASS III. Local Diseases.	CLASS IV. Developmental Diseases.	CLASS V. Violent Deaths.
1856	250·53	139·54	310·43	168·94	130·51
1857	263·33	135·20	318·17	160·99	122·31
1858	303·21	134·63	297·60	170·93	97·53
1859	334·15	127·14	291·31	146·28	101·12
1860	386·22	114·91	280·75	142·93	75·19
1861	362·60	128·28	290·96	130·19	87·97
1862	308·57	124·12	306·67	166·57	94·07
1863	285·02	124·34	333·51	152·65	104·48
1864	272·25	135·95	346·05	150·89	94·86
1865	308·21	136·92	314·45	153·24	87·18
Mean of 10 Years	307·42	130·10	308·99	154·27	99·22

101. The following are amongst the results which are deducible from this table :—

102. The number of deaths from zymotic diseases in 1000 deaths from all causes, averaged 307 in the ten years ending the 31st December, 1865. The highest proportion in any one of the ten years was in 1860, when deaths from this class of affections amounted to 386 in 1000. The lowest proportion was in 1856, when they barely amounted to 251 in 1000. They were above the average of the decenniad in 1859, 1860, and 1861 ; they were within a trifle of that average in 1862 and 1865, and they were below it in the other five years.

103. Constitutional diseases caused upon the average 130 deaths in 1000 during the ten years. The highest proportion to the 1000 was 140 in 1856, and the lowest 115 in 1860. Deaths under this head were over the average in the first three and the last two years of the decenniad, and below it in the five intervening years.

104. The proportion of deaths from local diseases is on the average 309 in 1000 from all causes. This number was exceeded in the first two and the last three years of the ten, and was not reached in the five intermediate years. The highest proportion was 346 in 1000, and occurred in 1864; the lowest was 281 in 1000, and took place in 1860.

105. Deaths from developmental diseases were in the whole period of ten years in the proportion of 154 in 1000, which average was exceeded in 1856, 1857, 1858, and 1862, and not equalled in the other six years. The greatest proportion of deaths to the thousand from this class was 170 in 1858, and the smallest was 130 in 1861.

106. Violent deaths were about in the proportion of 99 to the thousand from all causes, in the ten years, the highest average being 131 in 1856, and the lowest, 75 in 1860. The decennial mean was exceeded in 1856, 1857, 1859, and 1863, and not reached in the remaining six years.

107. The next table gives the number of deaths of persons of all ages, from all causes, and from each class of causes, to every 1000 of the average population of the colony during each of the last ten years.

TABLE XXIII.—DEATHS FROM EACH CLASS OF DISEASES.—PROPORTION TO THE LIVING POPULATION, 1856-1865.

YEARS.	NUMBER OF DEATHS TO EVERY 1000 OF THE MEAN LIVING POPULATION, FROM—					
	Total Specified Causes.	CLASS I. Zymotic Diseases.	CLASS II. Constitutional Diseases.	CLASS III. Local Diseases.	CLASS IV. Developmental Diseases.	CLASS V. Violent Deaths.
1856	14·82	3·71	2·07	4·60	2·50	1·94
1857	17·12	4·51	2·31	5·45	2·76	[illegible]·09
1858	18·45	5·60	2·48	5·49	3·14	1·74
1859	18·28	6·11	2·32	5·33	2·67	1·85
1860	22·17	8·[illegible]	2·55	6·22	3·17	1·67
1861	19·35	7·02	2·48	5·63	2·52	1·70
1862	18·26	5·63	2·27	5·60	3·04	1·72
1863	16·86	4·81	2·10	5·62	2·57	1·76
1864	14·99	4·08	2·04	5·19	2·26	1·42
1865	16·90	5·21	2·32	5·31	2·59	1·47
Mean of 10 years	17·72	5·52	2·29	5·45	2·72	1·74

108. By this table it is seen that the number of deaths from specified causes* is in the average proportion of 17·7 to every 1000 of the population; that the highest mortality in ten years was 22 to the 1000, and occurred in 1860; and the lowest was 15 to the 1000, and occurred in 1856 and 1864; that the decennial average was exceeded in the five years from 1858 to 1862 inclusive, and was not equalled in the other five years.

109. It is also observable that the average mortality from zymotic

* The deaths from specified causes amount to 99 out of 100 of the deaths from all causes. This high proportion indicates great care on the part of the Deputy-Registrars of Victoria.

diseases, as gathered from the results of ten years, is 5·52 to the 1000 persons living; that the average from constitutional diseases is 2·29 to the 1000; that the average from local diseases is 5·45 to the 1000; that the average from developmental diseases is 2·72 to the 1000; and that the average from violence is 1·74 to the 1000.

110. It is further evident that the year which relatively to the population was that of the greatest total mortality, 1860, was also that of the highest mortality from zymotic diseases (8·56 to the 1000), from constitutional diseases (2·55 to the 1000), from local diseases (6·22 to the 1000), and from developmental diseases (3·17 to the 1000), and that the year in which the relative number of violent deaths was greatest was 1857 (2·09 to the 1000).

111. In like manner, the years in which the rate of mortality was lowest from each class of causes, and the years in which it was greater or less than the decennial rate, may be ascertained from the table.

112. The following table shows the number of persons, at various periods of life, who died from all causes and each class of causes in 1000 deaths of persons at all ages, from all causes and from each class of causes, the results being the average of ten years, as in previous tables.

Table XXIV.—Deaths at Various Ages from each Class of Diseases.—Proportion to the Deaths at All Ages from each Class, 1856-1865.

Ages.	Number of Deaths at All Ages, from—					
	All Causes.	Class I. Zymotic Diseases.	Class II. Constitutional Diseases.	Class III. Local Diseases.	Class IV. Developmental Diseases.	Class V. Violent Deaths.
Under 1 year	323·36	336·84	153·27	299·91	681·83	65·70
1 to 5 years	210·24	339·88	128·85	152·64	167·78	148·63
5 to 15 ,, ...	57·24	97·31	32·37	41·48	5·72	92·11
15 to 45 ,, ...	283·71	171·81	536·33	316·31	75·03	536·21
45 to 60 ,, ...	76·16	36·50	113·96	122·79	16·52	100·39
60 and upwards ...	44·29	17·66	35·22	66·87	53·12	56·[illegible]
Total	1000·00	1000·00	1000·00	1000·00	1000·00	1000·00

113. It is thus seen that, in every 1000 deaths from zymotic diseases, 337, or about a third, are of children under 1 year, which is rather higher than the proportion that the deaths of children under 1 year bear to the deaths from all causes (328 in 1000), and is within a trifle of the proportion that deaths from zymotic diseases in the next four years of life, viz., from 1 to 5, bear to the total deaths from zymotic diseases (340 in 1000).

114. It is also seen that deaths from all causes at the last four periods of life, embracing ages from five years upwards, bear a higher proportion to the deaths at all ages than do the deaths from zymotic diseases; but at the first two periods, comprising ages under five years, the proportion dying from zymotic diseases to the total deaths from zymotic diseases is greater than the proportion dying from all causes to the total deaths from all causes.

115. Similar comparisons may be made with respect to the other causes of death. Looking at deaths from developmental diseases, it will be observed that 681 in 1000, or more than two-thirds, occur to infants under one year of age, whilst only 328 in 1000, or less than one-third of the

deaths from all causes, are of children at that age. Also that of deaths from violence, 536 in 1000, or more than half, occur to persons between the ages of 15 and 45, whereas only 284 in 1000 of the deaths from all causes are of persons at those ages.

116. Of zymotic diseases, which include all those of an epidemic, endemic, contagious, or infectious character, the most fatal are diarrhœa and dysentery, which prevail chiefly during the summer months. In ten years these caused on an average 123 deaths in 1000, or about an eighth part of the total mortality. The years of greatest mortality from them were 1858, in which they caused 163 deaths in 1000; 1859, in which they caused 155 in 1000; and 1860, in which they caused 148 in 1000. The years of least mortality from the same complaints were 1864, in which they caused no more than 87, and 1863, in which they caused only 92 deaths in 1000. Scarlatina, measles, and diphtheria have also been very fatal in some years, especially among children. The first two complaints prevailed in 1853, during the last six months of which year they caused 95 deaths in every 1000 from all causes. In the following year the mortality from them fell to 43 in 1000, and from that time they were but little felt until 1860, when they broke out in an epidemic form, and together caused 59 deaths in 1000. In 1861 the mortality from them rose to 107 in 1000, in 1862 it fell to 44 in 1000, in 1863 to 34 in 1000, in 1864 to 32 in 1000, and in 1865 to 22 in 1000. Diphtheria was apparently unknown until 1858, in which year six deaths from its effects were recorded, being less than 1 in 1000. In 1859 deaths from diphtheria increased to 30 in 1000 from all causes, and in 1860 to 53 in 1000, which was the maximum. In 1861 the mortality from diphtheria was 49 in 1000, in 1862 it was 36 in 1000, in 1863 it was 35 in 1000, in 1864 it rose to 51 in 1000, and in 1865 it again fell to 38 in 1000. Small-pox has never spread in the colony. A few cases have from time to time been brought by ships, but have quickly died out by isolation. The same may be said of typhus. Typhoid fevers, however, are by no means rare, a type of which, locally called "colonial fever," is frequently fatal. Agues are uncommon, as are also remittent fevers. No case of Asiatic cholera has ever occurred in any part of Australia. Hydrophobia is unknown.

117. Constitutional diseases are divided into diathetic and tubercular. The former includes gout, dropsy, cancer, &c., and the latter scrofula, tabes mesenterica, phthisis, hydrocephalus, &c.

118. Cancer in a fatal form has been increasing of late years. In the last six months of 1853 it only caused 1 death, and in 1854 only 3 deaths, in every 1000 from all causes; whereas in 1862 it caused 8 deaths in 1000, in 1863 11 in 1000, in 1864 and 1865 14 deaths in 1000. On the other hand, dropsy is not so fatal now as formerly. In 1853 it caused 20 deaths, and in 1854 13 deaths in 1000 from all causes; in 1864 it caused only 8, and 1865 only 7 deaths in 1000. Gout as a fatal disease is uncommon. In 1865 it caused ·48 deaths in 1000, but this proportion is much above the average. During several years no death from gout was recorded.

119. Phthisis is by far the most fatal disease of the tubercular type of constitutional diseases, and next to it hydrocephalus. The former caused on the average 72 deaths, and the latter 20 deaths in every 1000, from all causes, during 10 years.

120. Local diseases include all those of particular organs, and are divided as follows :—1. Diseases of the nervous system, which in 10 years

caused upon the average 111 deaths in every 1000 from all causes. 2. Diseases of the organs of circulation, which caused upon the average 39 deaths in 1000. 3. Diseases of the respiratory system, which caused 84 deaths in 1000. 4. Diseases of the digestive organs, which caused 62 deaths in 1000. 5. Diseases of the urinary organs, which caused 6 deaths in 1000. 6. Diseases of the organs of generation, which caused a fraction less than 2 deaths in 1000. 7. Diseases of the locomotive system, which caused a fraction more than 2 deaths in 1000. 8. Diseases of the integumentary system, which caused nearly 2 deaths in 1000.

121. Developmental diseases, or those of growth, nutrition, or decay, are divided into those of children, those of adults, those of old people, and diseases of nutrition.

122. Developmental diseases of children are premature birth, malformations, and teething. In ten years 36 deaths in every 1000 resulted from the last-named cause. Developmental diseases of adults refer chiefly to those incidental to child-bearing. In ten years, the number of women who died from childbirth, including metria, was in the proportion of 1 to every 239 children born alive. The deaths classed under developmental diseases of old people refer only to those caused by old age. The most fatal diseases of nutrition are atrophy and debility, from which, on an average, 83 deaths were caused in every 1000 which occurred during ten years.

123. Violent deaths are not so numerous now as formerly. In 1856, 130 deaths, and in 1857 122 deaths in every 1000 resulted from external injuries. In 1864 the proportion was 95; and in 1865, 87 in every 1000. The persons who committed suicide in ten years numbered 574, of whom 485 were males and 89 were females. The criminals executed during the same period numbered 56, of whom only one was a female.

CHINESE MORTALITY.

124. During the 9 years 1853-1861, 2183 Chinese deaths were registered. Their ages ranged from 20 to 45 years. In the same period 9873 European males died at the same ages. The following are the principal causes of death amongst the Chinese, arranged in order of fatality, and placed side by side with the deaths of European males between 20 and 45 years of age:—

TABLE XXV.—DEATHS OF CHINESE AND EUROPEANS COMPARED, 1853-1865.

Principal Causes of Death.	Deaths of Chinese.		Deaths of European Males between 20 & 45 years old.	
	Number.	Percentage.	Number.	Percentage.
Typhoid Fever	489	22·40	1191	12·06
Dropsy	156	7·15	38	·38
Pneumonia	147	6·73	432	4·38
Heart Disease	145	6·64	489	4·95
Accidents	119	5·45	2352	23·82
Dysentery	103	4·72	697	7·06
Phthisis	81	3·71	1791	18·14
All other causes	943	43·20	2883	29·21
Total	2183	100·00	9873	100·00

125. The causes given occasioned 57 per cent. of the deaths of Chinese, but nearly 70 per cent. of those of European males at like ages. It will be observed that a wide difference obtains in the fatality of the different diseases as affecting the two races; that the mortality from dropsy was very much greater amongst the Chinese, the deaths from it numbering 156, or a fourteenth of the whole, against only 38, or about 1 in 260, of deaths of Europeans; that typhoid fevers, pneumonia, and heart disease, were also relatively more fatal to Chinese; that the mortality from phthisis was very small amongst them when compared with the effects of the same disease amongst Europeans; that dysentery was also less fatal to the former race, and that they enjoyed a great immunity, comparatively speaking, from accidents. The last is a remarkable fact, when it is remembered that the bulk of them are employed in mining.

126. In the year 1854, 50 Chinese out of 105 from all causes died of an epidemic the nature of which is unknown. These Chinese had but recently landed, and were living in tents pitched on the south side of the river Yarra, near Melbourne.

127. It may be remarked that suicide is by no means uncommon amongst the Chinese. No fewer than 90 deaths in 13 years are known to have been self-inflicted.

SICKNESS AND INFIRMITY.

128. The numbers and ages of persons unable to perform their usual avocations on account of sickness or accidents, of lunatics, of deaf and dumb persons, and of the blind, were returned in the census. The following are the totals:—

TABLE XXVI.—SICKNESS AND INFIRMITY, 1861.

NATURE OF INFIRMITY.	Persons.	Males.	Females.
Sick	2343	2045	298
Suffering from Accidents	556	545	11
Lunatics	660	397	263
Deaf and Dumb	60	37	23
Blind	126	88	38
Total	3745	3112	633

129. The total number of cases of infirmity, including the sick, the maimed, the insane, the deaf and dumb, and the blind, amounted to 3745. This, in a population of 540,322, gives a proportion of 1 person in every 145 rendered non-effective, either temporarily or permanently, by one of the causes adduced. The disabled males were in the proportion of 1 to every 106 of the male population, the disabled females in that of 1 to every 334 of the female population of the colony.

130. The sick were in the ratio of 1 in every 231 of the population, those suffering from accidents in that of 1 in every 972. The sick and the maimed together amounted to 2899, a number which furnishes a proportion relatively to the whole population of 1 in 186. The lunatics returned furnish a proportion of 1 lunatic to every 819 inhabitants of the colony, 1 lunatic male to every 828 males, 1 lunatic female to every 805

females. The deaf and dumb returned give 1 deaf mute to every 9005 persons of both sexes, 1 deaf and dumb male to every 8882 males, 1 deaf and dumb female to every 9203 females. The blind returned were in the proportion of 1 to every 4288 of both sexes, 1 blind male to every 3735 males, 1 blind female to every 5570 females.

131. Since Victoria is indebted to immigration for the bulk of her population, and persons afflicted with deaf muteism or blindness would not be likely to become immigrants, it would obviously be unfair to compare the statistics of these maladies as they exist in this colony with those of older countries, in all of which the proportional number of deaf and dumb, and of blind persons, is much higher than it is in Victoria.* The results obtained, however, also contrast favourably with those of South Australia, which appears to be the only other colony of this group which has published similar returns. In South Australia there is 1 deaf mute in as few as 6341 persons; in Victoria there is only 1 in 9005. In South Australia, there is 1 blind person in every 3252 inhabitants, against 1 in 4288 in Victoria.

132. It may be interesting to note that 1 person, a male, was returned as deaf, dumb, and blind, and that 2 of the deaf and dumb, 1 male and 1 female, were returned as idiots; also, that 1 Chinese was returned as deaf and dumb, and 3 aborigines as blind.

MILITARY.

133. Although Melbourne is the head-quarters of the military force in Australia, only a small detachment of troops is generally kept up.† At the end of 1865 there were no more than 121 of all ranks in the colony. The following table shows the numbers of each rank:—

TABLE XXVII.—MILITARY OF ALL RANKS, 1865.

Branch of the Service.	Officers.	Sergeants.	Drummers.	Rank and File.	Total.
General's Staff	3	2	...	...	5
Commissariat Staff	2	...	...	...	2
Medical Staff	2	1	...	...	3
Purveyor's Staff	1	...	...	...	1
Royal Artillery	3	7	2	91	103
12th Regiment, 1st Battalion	...	...	...	2	2
40th Regiment	...	...	...	4	4
Army Hospital Corps	...	...	...	1	1
Total	11	10	2	98	121

* In some parts of Switzerland there is said to be 1 deaf mute in every 206 of the population. In England and Wales, in 1851, the proportion was 1 in 1738. The statistics relating to blindness show a range varying from 1 blind person in 482 of the inhabitants of Norway to 1 in 979 of those in England and Wales. (See *Report upon the Census of Great Britain*. 1851.)

† Whilst these pages were being printed, the head-quarters of the 2nd battalion of the 14th regiment, consisting of 15 officers and 466 non-commissioned officers and soldiers, arrived in Melbourne from New Zealand. It is understood that this contingent, or one of equal strength, will be stationed in the colony permanently, or, at any rate, for some time to come.

134. The military expenditure in 1865 was as follows :—

Imperial Expenditure	£9,653 9 1
Colonial do.	5,486 16 3
Total	£15,140 5 4

VOLUNTEERS.

135. The volunteer force of Victoria is a fine body of men, and its members have shown much zeal in rendering themselves effective. The total establishment authorised is 3585, consisting of two corps of naval brigade, each numbering 150; seven troops of cavalry, each numbering 30; seven corps of artillery, each numbering 150; one corps of engineers, numbering 75; and thirteen corps of rifles, each numbering 150.

136. The strength of the force at the end of 1865 was as follows :—

Officers	127
Sergeants	131
Rank and File	3388
Total	3646

137. In addition to these there were 12 volunteer staff and unattached officers, 94 paid staff and head-quarters band and drummers (consisting of 5 officers, 29 sergeants, and 60 rank and file), and 140 extra band not included in the strength of corps, making a grand total of 3892, or 307 in excess of the establishment.

138. The following was the strength of the respective branches of the service at the end of 1865 :—

Naval Brigade	302
Cavalry	242
Artillery	1046
Engineers	77
Rifles, Metropolitan and Suburban Corps	1207
Do. Country Corps	1012
General Staff, not attached to any particular Corps	6
Total	3892

139. The volunteers are armed with the following rifles, the property of the Government :—

Long Enfields	263
Short do.	86
Lancaster	1829
Sea Service	340
General Hay	919
Breech-loading Carbines	458
Total	3895

140. The total expenditure of the volunteer force for the year 1865 was £18,619.

141. Volunteers in Victoria are entitled to a grant from the Crown of 50 acres of land, after five years' effective service.

NATURALISATION.

142. Aliens residing in Victoria may obtain letters of naturalisation upon taking an oath of allegiance to the Crown before any judge or police magistrate, as prescribed by an Act of the Legislature (26 Vict., No. 166).

143. But without becoming naturalised, alien friends resident in the colony may acquire real and personal property, and may hold, convey, devise, and bequeath it in the same manner as if they had been natural-born subjects of Her Majesty.

144. Alien women being married to British subjects thereby become naturalised.

145. The following table shows the number of persons of different countries who have procured letters of naturalisation during the last six years:—

TABLE XXVIII.—PERSONS NATURALISED, 1860-1865.

Subjects of	Number Naturalised in each Year.						
	1860.	1861.	1862.	1863.	1864.	1865.	Total in 6 yrs.
France	4	8	8	8	8	8	44
Belgium	1	1	1	2	—	1	6
Holland	1	—	—	3	1	2	7
Austria	2	4	3	1	—	3	13
Prussia	65	42	43	47	26	34	257
Other German States	56	93	59	41	39	50	338
Italy	5	8	5	5	2	6	31
Spain	—	2	1	—	—	—	3
Portugal	2	1	—	—	—	1	4
Russia	—	—	5	2	1	1	9
Other European Countries	39	77	64	42	49	23	294
United States	3	11	6	4	5	1	30
South and Central American States	—	1	—	1	1	—	3
China	9	2	5	8	6	2	32
Other Countries	1	—	—	—	1	1	3
Total	188	250	200	164	139	133	1074

PRODUCTION.

CROWN LAND SALES.

146. During the year 1865, 7157 allotments of Crown land were sold, and 11 allotments were granted. The whole area of sold lands was 139,776 acres, and that of granted lands was 19 acres, making a total of 139,795 acres sold and granted. The amount realised upon land sales was £295,456, or an average of £2 2s. 3d. per acre.

147. The following table shows, in classified arrangement, the number and extent of the lots sold and granted during the year:—

TABLE XXIX.—CROWN LANDS GRANTED AND SOLD, 1865.

Classification of Allotments.	Allotments Granted.				Allotments Sold.			
	Number.	Extent.			Number.	Extent.		
		a.	r.	p.		a.	r.	p.
Under 100 acres	11	19	0	18	6649	56,319	0	$31\frac{2}{3}$
100 acres to 500 acres	...	...			506	82,309	1	11
Over 500 acres	...	...			2	1,147	0	0
Total	11	19	0	18	7157	139,775	2	$2\frac{2}{3}$

148. The extent of Crown land granted and sold, the gross amount realised, and the average price per acre during each of the last ten years,

were as follow. It will be observed that the greatest quantity of land was alienated in 1862, that the largest amount of money was obtained in 1857, that the average price per acre was highest in 1858, and that less land was alienated in 1865 than in any of the nine previous years.

TABLE XXX.—CROWN LANDS SOLD, EXTENT AND VALUE, 1856-1865.

Year.	Extent of Land Alienated during the Year.						Amount Realised during the Year.					
	Granted without Purchase.			Sold.			Total.			Average per Acre.		
	a.	r.	p.	a.	r.	p.	£	s.	d.	£	s.	d.
1856	105	2	6	437,562	0	0	749,317	18	3	1	14	[illegible]
1857	8	2	5	500,383	1	3	1,067,450	8	1	2	2	7
1858	68	0	33	255,724	2	28	638,650	1	3	2	9	11
1859	122	2	1	459,081	2	7	814,163	15	6	1	15	5
1860	26	3	7	492,247	2	7	663,238	8	2	1	6	11
1861	51	0	10	514,744	3	12	628,487	14	5	1	4	2
1862	200	3	31	844,969	2	38	910,862	7	7	1	1	7
1863	46	3	28	295,180	0	1	450,645	13	3½	1	10	6
1864	114	0	30	260,169	0	5	522,601	10	9½	2	0	2
1865	19	0	18	139,775	2	3	295,455	18	8	2	2	3

149. Since the first founding of the colony, over 1000 acres (1020 a. 2 r. 27 p.) have been granted without purchase, and over 6,000,000 acres (6,048,682 a. 3 r. 23 p.) have been sold. The total extent alienated by grant and sale, up to the end of 1865, was thus 6,049,703 a. 2 r. 10 p. Considering the area of the colony as being 55,644,160 acres, the extent unalienated at the same period would be 49,594,456 a. 1 r. 30 p.

150. The total amount realised upon the alienation of Crown land, from the first Port Phillip land sales to the end of 1865, has been £11,985,979; and the average price per acre, over the whole period, has been £1 19s. 7½d.

LEASES FOR OTHER THAN PASTORAL PURPOSES.

151. Besides the alienation of land by absolute sale, provision was made in the Land Act of 1862 (25 Victoria, No. 145), and also upon a more extended scale in the Amending Land Act of 1865 (28 Victoria, No. 237), for leasing Crown lands for agricultural purposes to selectors, with a view to their ultimate purchase in fee by the lessee.

152. The following are the number of lots and extent of land leased during the last three years:—

TABLE XXXI.—CROWN LANDS LEASED, 1863-1865.

Year.	Allotments Leased.			
	Number.	Extent.		
		a.	r.	p.
1863	1668	116,505	3	34
1864	106	3,475	1	36
1865	6961	1,820,173	3	8

LICENSES FOR PASTORAL PURPOSES.

153. The bulk of the unsold lands of Victoria are held under licenses for pastoral purposes. These licenses are renewed annually, but it was provided by the Land Act of 1862 that no license shall be granted after

the 1st January, 1870, and consequently the present term of occupation expires on the 31st December of that year.

154. The rent paid by the pastoral licensees, or squatters, as they are termed, for the occupation of their runs, is in accordance with the grazing capabilities of the land contained therein, upon the following scale :—Two shillings yearly for each head of cattle or horses the run can depasture, and eightpence for each sheep.

155. The number of squatters at the end of 1865 was 1125, who held in the aggregate 29,354,436 acres. This was in the proportion of 26,093 acres to each squatter.

The following table shows the number of squatting runs, and the extent of land contained therein, for a series of years :—

TABLE XXXII.—SQUATTING RUNS, NUMBER AND AREA, 1856-1865.

Year.	Number of Runs.	Approximate Area.
		Acres.
1856	1026	32,326,468
1857	1035	—
1858	1179	—
1859	1192	—
1860	1223	—
1861	1265	41,400,080
1862	1249	37,023,093
1863	1161	28,826,756
1864	1177	30,463,999
1865	1125	29,354,436

AGRICULTURE.

156. The agricultural statistics of Victoria are collected yearly under the Registrar-General, the cost being defrayed by an annual vote of Parliament for that purpose. The system pursued has proved most effective, and it is a question whether, among the very few nations who secure records of this kind, more accurate and copious returns are obtained.

MODE OF COLLECTING AGRICULTURAL STATISTICS.

157. A brief account of the manner in which the agricultural returns are procured may not be uninteresting.

158. The colony being first divided into districts of such a size as experience has shown to be most suitable, they are allotted to paid collectors, who receive minute printed instructions as to the nature of their duties. These are directed to call upon every occupier of land, provided his holding is of a larger extent than one acre. At each holding they are enjoined to make inquiries as to the nature of the tenure under which the land is held; the number of acres occupied and fenced; the number cultivated, with each crop; the produce of each crop; the number of hands employed; the quantity of live stock of each kind kept; and the number, description, and value of agricultural implements and machines used. These particulars are inserted by them in the schedule (Appendix D), to which the signature of the occupier is then obtained, as a guarantee—first, that a personal visit has really been paid to the holding; and secondly, that the information is authentic.

159. After the returns are collected in this manner, the contents of the

schedules are transcribed by the collectors upon larger sheets containing columns corresponding with the blank spaces for entries in the schedules. The columns are then added, and summaries are thus made of the different parishes and of the entire county or district allotted to the collector, who then forwards both schedules and sheets to the Registrar-General's Office.

160. Upon their receipt they are subjected to a slight checking, to ascertain that no gross errors exist, and a summary is immediately made of the entire colony, showing the particulars on the single total lines of each county and unsettled district. This summary is then published in the *Government Gazette* as an "Approximate Summary" for general information.

161. After this has been published, the returns are subjected to a further checking. Each entry on the sheet is examined with the corresponding entry upon the schedules, and all errors are corrected. Summary tables are then made of each county, showing its various parishes, and of the colony, showing the various counties. Further tables are then constructed from these summaries, showing percentages of increase and decrease, averages of produce, classification of holdings as to size and tenure, and many other details. Summaries of live stock, and tables showing the number of hands employed, and the agricultural machinery in use, are also given; and when a report has been written, the whole is published, and presented to Parliament.

162. The collectors are also instructed to inquire into every instance of remarkably large or small yield, and to endeavour to ascertain the causes; also, to note any circumstances worthy of mention, such as peculiar descriptions of soil, remarkable varieties of grain or seed, &c.; likewise to seek information, wherever practicable, as to the causes of the partial or entire failure of crops, and whether owing to aspect, hot winds, drought, moisture, or attacks of insects, and also as to the precise periods at which such visitations occurred. The whole of these matters, as well as any other respecting their districts which may be worth noticing, they are expected to embody in reports. Much valuable information is thus obtained, which is published with the tables.

163. In addition to the returns mentioned, the collectors are supplied with the forms requisite to procure statistics respecting the mills for grinding and dressing grain, the various branches of manufacturing industry, and of the number of private schools and scholars throughout their districts. A great deal of useful information is thus obtained, which could only be got by the employment of regular collectors.

164. The information obtained is given voluntarily, and it is highly desirable that the populations of England and other European states should follow the example of Victoria in this regard.

165. The agricultural year ends on the 31st March, by which time the previous season's crops are stored.

166. The number of occupiers of lots above one acre in extent, on the 31st March, 1866, was 20,063. The area in their occupation was 6,785,225 acres. This acreage gives an average of 338 acres to each holder, or about 11 acres to every man, woman, and child in the colony.

167. The area enclosed at the same period was 5,357,962 acres, or 79 per cent. of the land in occupation.

168. The total extent cultivated was 530,196 acres, or nearly 8 per cent. of the occupied land. The average cultivated by each occupier was 26½

acres. The ratio of cultivated land to the population was 100 acres to every 118 persons.

169. The number of holdings, the extent of land in occupation, the extent enclosed, and that cultivated during each of the last ten years, have been as follow :—

TABLE XXXIII.—LAND OCCUPIED, ENCLOSED, AND CULTIVATED, 1857-66.

YEAR ENDING 31ST MARCH.	Number of Holdings.	Area in Occupation.	Area Enclosed.	Area Cultivated.
		Acres.	Acres.	Acres.
1857	7,523	1,532,349	...	179,883
1858	10,259	2,113,134	...	237,728
1859	11,573	2,519,157	1,724,377	293,960
1860	13,175	3,015,607	2,048,092	358,728
1861	13,653	3,517,034	2,495,394	419,380
1862	14,960	4,090,784	2,789,836	439,895
1863	16,416	4,722,050	3,353,200	465,430
1864	17,679	5,554,531	4,098,500	507,798
1865	18,355	6,125,204	5,030,978	479,463
1866	20,063	6,785,225	5,357,962	530,196

170. The principal crops during the past ten years have been wheat, oats, barley, potatoes, hay, and green forage for cattle. The greatest extent of land was placed under wheat in 1862, when nearly 200,000 acres were devoted to that crop, equal to 45 per cent. of the land in cultivation. The area under wheat fell off in 1865 to 125,000 acres, in consequence of the almost universal presence of the disease termed *rust*. A dread of a second visit from this disease prevented the farmers from cultivating wheat in 1865 to the same extent as before. Since, however, it did not revisit the crops in 1865, the farmers were encouraged to resume the cultivation of wheat, which resulted in nearly 180,000 acres being successfully placed under that crop during the past year. The greatest extent under oats—over 150,000 acres—was in 1864 ; the greatest extent under barley—nearly 8000 acres—was also in 1864 ; the greatest extent under potatoes—about 32,000 acres—was in the past year ; the greatest extent under hay—about 102,000 acres—was in 1863 ; the greatest extent under green forage—about 56,000 acres—was in the past year.

171. The extent of land under each of the principal crops during the last ten years is shown as follows :—

TABLE XXXIV.—LAND UNDER PRINCIPAL CROPS, 1857-1866.

YEAR ENDING 31ST MARCH.	Extent of Land placed under					
	Wheat.	Oats.	Barley.	Potatoes.	Hay.	Green Forage.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1857	80,155	25,625	2,234	16,281	51,987	969
1858	87,230	40,222	5,409	20,698	75,536	2,075
1859	78,234	77,527	5,322	30,026	86,163	7,409
1860	107,093	90,167	4,102	27,622	98,571	10,351
1861	161,252	86,337	4,123	24,842	90,921	17,661
1862	196,922	91,061	3,419	27,174	74,681	16,692
1863	162,009	108,196	6,830	24,821	101,639	28,718
1864	149,392	152,326	7,795	27,584	96,350	35,342
1865	125,040	144,303	7,648	31,172	85,146	40,061
1866	178,628	102,817	6,887	31,644	97,902	55,830

172. In the past season (ending 31st March, 1866) wheat covered about 34 per cent. of the whole land in cultivation, oats covered about 19 per cent., barley a little over 1 per cent., potatoes nearly 6 per cent., hay about 18 per cent., and green forage nearly 11 per cent.

173. The produce of the first five of these crops during the same ten years was as follows (no account is kept by the farmers of the weight of green forage produced) :—

TABLE XXXV.—PRODUCE OF PRINCIPAL CROPS, 1857-1861.

YEAR ENDING 31ST MARCH.	QUANTITY OF PRODUCE RAISED.				
	Wheat.	Oats.	Barley.	Potatoes.	Hay.
	Bushels.	Bushels.	Bushels.	Tons.	Tons.
1857	1,858,756	641,679	69,548	36,895	81,151
1858	1,808,439	1,249,800	156,459	51,116	137,476
1859	1,563,113	2,160,358	115,619	108,467	113,543
1860	2,296,157	2,553,637	98,433	48,967	135,643
1861	3,459,914	2,633,693	83,854	77,258	144,211
1862	3,607,727	2,136,430	68,118	59,364	92,479
1863	3,008,487	2,504,301	143,056	50,597	110,680
1864	1,338,762	3,497,520	130,664	74,947	121,840
1865	1,899,378	2,694,445	124,849	59,828	97,731
1866	3,514,227	2,279,468	153,490	83,166	96,101

174. The average produce to the acre of these crops during the past season, and for the whole period of ten years, has been as follows :—

	DURING YEAR 1865-1866.	DURING TEN YEARS, 1857-1866.
Wheat, bushels	19·67	18·76
Oats, ,,	22·17	25·38
Barley, ,,	22·29	22·18
Potatoes, tons	2·63	2·45
Hay, ,,	0·98	1·34

175. The highest acreable produce of wheat during the ten years was in 1857, when a fraction over 23 bushels was reached ; the lowest was in the year of the rust (1864), when the average was 9 bushels. These rates, although they appear low as contrasted with those of England and Wales, are yet higher than anything that can be produced in the adjacent colonies of South Australia and New South Wales. In the former colony, during the seven years 1859-65, $12\frac{3}{4}$ bushels to the acre was the average wheat crop, and 14 bushels was the highest average reached in any one year of the period, and that only upon one occasion. In New South Wales, the average for a period embracing the six years 1860-65 was $11\frac{1}{2}$ bushels, and the highest average of any year of the period was barely 14 bushels.

176. Besides these crops, a certain amount of attention has each year been paid to the cultivation of others of minor importance, such as maize, rye, peas and beans, mangolds, vegetables, &c., for all of which the soil and climate of Victoria are well adapted. The following is the result of that cultivation during the past ten years :—

Table XXXVI.—Minor Crops, 1857-1866.

Year Ending 31st March.	Maize.	Rye and Bere.	Peas, Beans, Millet, and Sorghum.	Turnips.	Mangel Wurzel.	Beet, Carrots, Parsnips, and Cabbage.	Onions.
	Extent of Land under Crop.						
	acres.	acres.	acres.	acres.	acres.	acres.	acres.
1857	327	—	—	512	108	65	25
1858	446	—	133	355	119	63	—
1859	480	58	265	332	185	175	—
1860	738	149	395	221	383	296	—
1861	1650	112	662	495	1029	734	—
1862	1714	66	696	187	806	430	249
1863	1250	149	1261	196	806	591	143
1864	1711	207	975	104	836	431	157
1865	597	419	2783	102	849	464	120
1866	326	551	4253	96	1249	505	183
	Quantity of Produce Raised.						
	bushels.	bushels.	bushels.	tons.	tons.	tons.	cwt.
1857	8,308	—	—	5073	2,165	308	1,685
1858	6,558	—	2,797	1684	2,876	268	—
1859	9,698	651	4,833	1335	2,157	674	2,690
1860	7,375	2692	5,590	674	4,645	1099	1,029
1861	25,045	1720	11,973	2276	13,446	4129	26,189
1862	20,788	1245	11,050	1120	6,142	2676	6,262
1863	19,720	1853	17,404	1456	8,086	4313	6,548
1864	33,534	3408	16,471	627	8,741	4761	9,895
1865	3,980	5549	41,139	596	5,782	2279	8,083
1866	4,767	8555	60,068	435	11,763	2870	9,206

177. During the past season maize averaged 15 bushels to the acre; rye and bere, 16 bushels; peas, beans, &c., 14 bushels; turnips, 4½ tons; mangel wurzel, 9½ tons; beet, carrots, parsnips, and cabbage, nearly 6 tons; and onions, 50 cwt.

178. For some time past considerable attention has been paid to the growth of tobacco, and in average seasons it has proved a remunerative crop. During the past year 397 acres were placed under this crop, from which 3328 cwt. of tobacco was obtained, being an average of 8½ cwt. to the acre.

179. The cultivation of the vine is steadily increasing. In 1857, only 280 acres were devoted to this crop. During the past season, no less than 4078 acres of vineyards were returned. From these, 50,000 cwt. of grapes were gathered, of which 32,000 cwt. were made into wine, and 18,000 cwt. were otherwise disposed of. The wine produced amounted to 176,959 gallons, and the brandy to 795 gallons. It may be observed that Victorian wine is rapidly growing in favour with the public, and that the wise legislation embodied in the Wines, Beer, and Spirits Sale Statute of 1864 (27 Vic., No. 227) has afforded facilities for its disposal which have been the means of largely adding to its consumption.

180. Besides the vineyards, 6654 acres were in 1865-6 cultivated as gardens, and 3449 acres as orchards; 1705 acres were also placed under other crops—such as flax, mulberry and olive plantations, &c.; 33,042 acres were permitted to lie fallow during the year.

LIVE STOCK.

181. The quantity of live stock in the colony of Victoria during the past ten years will be found in the following table. It will be observed that horses and sheep are more numerous now than at any former period, that the greatest number of cattle existed in 1861, and that most pigs were kept in 1865.

TABLE XXXVII.—LIVE STOCK, 1857-1866.

Year ending 31st March.	Horses.	Cattle.	Sheep.	Pigs.
1857	47,832	646,613	4,641,548	52,227
1858	55,683	614,537	4,766,022	43,632
1859	68,323	699,330	5,578,413	37,756
1860	69,288	683,534	5,794,127	50,965
1861	76,536	722,332	5,780,896	61,259
1862	84,057	628,092	6,239,258	43,480
1863	86,067	576,601	6,764,851	52,991
1864	103,328	675,272	7,115,943	79,655
1865	117,182	640,625	8,406,234	113,530
1866	121,051	621,337	8,835,380	75,869

182. According to the latest returns, nearly three-fourths of the horses, more than half the cattle, and 92 per cent. of the pigs, were the property of farmers, but only about a sixth of the sheep belonged to farmers. The balance of the stock was the property of the pastoral licensees, or squatters, and was kept upon the Crown land embraced in their runs and the purchased land attached thereto.

183. It has been already stated that the area of the colony is estimated to be 86,831 square miles. According to this, there would have been, on the 31st March, 1866, 1·39 horses, 7·16 head of cattle, 101·75 sheep, and 0·87 pigs, or, in all, about 111 head of stock—large and small—to the square mile.

184. Estimating the population on the 31st of March to have been 628,627, there would be nearly 1 head of cattle, about 14 sheep, about a fifth of a horse, and about an eighth of a pig, to every man, woman, and child in the colony.

MANUFACTURES, MACHINERY, &c.

MANUFACTURES.

185. An attempt is made each year to secure returns of the manufactories and works in operation, by means of the staff employed for collecting statistics of agriculture. Considerable difficulty is, however, found in obtaining particulars from every establishment, and therefore the returns under this head must be looked upon as very much under-stating the truth.

186. The total number of establishments from which returns were procured for the year ending 31st March, 1866, was 903. Of these, 242 were connected with or dependent on agriculture, viz.:—118 flour mills, 16 agricultural implement manufactories, 14 bone manure manufactories, 8 bread and biscuit manufactories, 68 steam corn-crushing and chaff-cutting machines, 8 malt-houses, 1 starch and maïzena manufactory, and 9 tobacco

and cigar manufactories. Those working on raw materials, the production of the pastoral interest, numbered 93, viz.:—3 boiling-down establishments, 1 curled hair manufactory, 22 fellmongeries, 2 flock manufactories, 1 meat-curing establishment, 21 soap and candle works, and 43 tanneries. Works for the manufacture of food of which the raw material is not the produce of agriculture, and of articles of drink, numbered 151, viz.:—80 breweries, 5 coffee, chocolate, and spice works, 2 distilleries, 63 aërated waters and cordial manufactories, and 1 sugar refinery. Works for the making of building materials and carrying on plastic manufactures numbered 266, viz.:—139 brick-yards, 29 lime-kilns, 12 potteries, and 86 saw mills. Machine manufactories and those for working in brass, iron, or lead, numbered 56, viz.:—40 iron and brass and copper foundries, 2 lead works, 14 engineers' and machinists' establishments. The miscellaneous works and manufactures were as follow:—3 bag and sack makers, 1 basket-maker, 2 billiard-table manufactories, 1 blacking manufactory, 1 blue manufactory, 1 brush manufactory, 6 chemical works, 13 clothing manufactories, 3 cooperages, 6 dye works, 7 gas works, 1 glass gas-reflector manufactory, 4 hat manufactories, 1 ice manufactory, 1 organ-builder's establishment, 1 packing-case manufactory, 5 patent slips and floating docks, 1 establishment for oyster culture, 4 pianoforte manufactories, 9 steam printing establishments, 3 rope and twine manufactories, 1 railway carriage works, 1 salt works, 14 ship and boat builders' yards, 2 establishments for breaking road metal by steam machinery, and 3 waterworks.

187. Of the flour mills, 111 were worked by steam and 7 by water. Of the other works and manufactories requiring machinery, 253 were worked by steam, 9 by water, 1 by wind, and 143 by horse. The number of hands of both sexes employed on the various works, the number and horse power of the steam engines in operation, the approximate value of lands and buildings, and of manufacturing plant and machinery, were as follow:—

TABLE XXXVIII.—MANUFACTORIES, 1865-66.

Nature of Works.	Number.	No. of Hands Employed.		Steam Engines Employed.		Approximate Value of		
		Males.	Females.	Number	Amount of Horse power.	Lands & Buildings.	Machinery and Plant.	Totals.
						£	£	£
Breweries	80	614	...	...	...	132,932	101,134	234,066
Flour Mills	118	632	...	111	1995	234,305	197,850	432,155
Other works and manufactories	705	7628	1185	253	3494	561,433	1,042,042	1,603,475
Total	903	8874	1185	364	5489	928,670	1,341,026	2,269,696

188. In addition to these particulars, the proprietors of breweries gave the following returns of their operations during the year:—

Number of horses employed		405
Number of drays and waggons		228
Material used during the year:—		
Sugar	4,797,375 lbs.	
Malt	469,181 bushels.	
Hops	631,391 lbs.	
Beer made during the year	7,988,978 gallons.	

189. The following additional particulars were also obtained from the flour mills :—

Number of pairs of stones in use	323
Quantity of grain operated upon during the year :—	
Wheat	3,403,320 bushels.
Other	156,166 ,,
Flour made during the year	73,182 tons.
Meal made during the year	5,677 ,,

MINING MACHINERY.

190. The machines used in gold mining at the end of 1865 numbered 6337, representing an approximate total value of £1,773,271. The number of steam engines working was 964, of which 473 were employed in alluvial, and 491 in quartz mining. The aggregate horse power of the former was 8208, that of the latter was 8606, making a total of 16,814. The following machines were used in alluvial mining :—3228 puddling machines, 427 whims and pulleys, 115 whips, 78 horse-pumps, 648 sluices and toms (having 4428 sluice-boxes), 196 water-wheels, 33 hydraulic hoses, 102 pumps, 8 derricks, 25 crushing machines (having 461 stamp-heads), and 4 boring machines. The following machines were used in quartz mining :—99 crushing machines, having 5119 stamp-heads ; 231 whims and pulleys, 56 water-wheels, 15 derricks, 98 whips, and 10 quick-silver cradles.

AGRICULTURAL MACHINERY.

191. The quantity of machines and implements used upon farms and squatting stations, and their value, were returned by the collectors of agricultural statistics for the year ending 31st March, 1866. From the returns it appears that the number of steam engines used upon farms was 167, of a total horse power of 1312, and the number upon stations was 8, of a horse power of 72.

192. The following are the numbers of the different implements upon farms :—Chaffcutters, 2424 ; cheese presses, 25 ; cider presses, 3 ; clod crushers, 4 ; corn crushers, 84 ; corn shellers, 2 ; cultivators, 37 ; drays, 19,522 ; grape mills, 12 ; grubbers, 65 ; harrows, 12,678 ; drill harrows, 27 ; hay elevators, 14 ; hay press, 1 ; hay rakes, horse, 374 ; horse hoes, 123 ; horse shovels, 2 ; horse works, 723 ; irrigation works, 15 ; land scoop, 1 ; mowing machines, 83 ; ploughs, 14,995 ; vineyard ploughs, 2 ; potato diggers, 6 ; reaping machines, 1890 ; rollers, 1851 ; root cutters, 11 ; scarifiers, 449 ; scufflers, 3 ; seed drills, 66 ; sowing machine, 1 ; strippers, 190 ; threshing machines, 622 ; thistle cutter, 1 ; tobacco press, 1 ; turnip cutter, 1 ; waggons, 1845 ; waterpowers, 3 ; weighing machines, 98 ; windmill, 1 ; wine presses, 104 ; winnowing machines, 883 ; wool presses, 18.

193. The implements returned as being used on squatting stations were as follow :—Chaffcutters, 54 ; corn crushers, 5 ; cultivators, 7 ; drays, 853 ; harrows, 333 ; drill harrow, 1 ; horse hay rakes, 20 ; horse works, 18 ; irrigation work, 1 ; land scoop, 1 ; mowing machines, 7 ; ploughs, 469 ; reaping machines, 25 ; rollers, 30 ; root cutter, 1 ; scarifiers, 10 ; strippers, 6 ; threshing machines, 14 ; waggons, 17 ; weighing machines, 7 ; wine presses, 4 ; winnowing machines, 22 ; wool presses, 11.

194. The value of machines and implements on farms was estimated by the proprietors to be £704,588 ; that upon stations to be £24,693 ; making a total of £729,281.

195. The following is a summary of the returned value of the manufacturing, mining, and agricultural machinery in operation in Victoria:—

	VALUE.
Manufacturing machinery	£1,341,026
Mining machinery	1,773,271
Agricultural machinery	729,281
Total	£3,843,578

The above is exclusive of the value of any lands or buildings.

INTERCHANGE.

POSTAGE.

196. A most efficient postal system exists in Victoria. The number of Post-offices in the colony at the end of 1865 was 525. The number of town letters during the year was 1,519,620; the number of inland letters was 4,059,477; the number of inland newspapers was 3,151,385; the number of ship letters despatched to other colonies was 347,565; the number to Great Britain and foreign countries was 581,752; the number of ship newspapers despatched to other colonies was 299,632; the number to Great Britain and foreign countries was 807,584; the number of ship letters received from other colonies was 371,503; the number from Great Britain and foreign countries was 605,891; the number of ship newspapers received from other colonies was 285,940; the number from Great Britain and foreign countries was 1,492,988. The total number of letters which passed through the Post-office during the year 1865 was thus 7,485,808; and the total number of newspapers, 6,037,529. The revenue of the Post-office during the same year amounted to £135,355 4s. 9d.; and the expenditure, exclusive of the cost of steam postal communication with Great Britain, to £129,491 18s. 5d.

197. The number of Post-offices, the number of letters and newspapers which passed through them, and the income and expenditure of the Post-office during each of the last ten years, are shown in the following table, by reference to which it will be seen that the greatest number of letters was transmitted in 1860, but the greatest number of newspapers in 1865.

TABLE XXXIX.—POSTAGE, 1856-1865.

YEAR.	Number of Post Offices	Number of Letters Passed through the Post Offices.	Number of Newspapers Passed through the Post Offices.	Income.			Expenditure.		
				£	s.	d.	£	s.	d.
1856	125	3,220,614	2,906,141	64,951	0	11	93,681	18	0
1857	152	3,899,981	2,981,970	77,662	12	1	96,242	11	9
1858	232	5,025,820	4,264,691	89,997	13	6	118,223	16	5
1859	263	6,649,288	5,051,402	111,712	12	4	126,693	6	0
1860	311	8,116,302	5,683,023	120,472	12	5	133,064	11	3
1861	369	6,109,929	4,277,179	127,869	9	2	109,276	7	2
1862	408	6,276,623	4,909,219	128,643	19	4	109,148	5	3
1863	437	6,636,291	4,930,646	134,027	11	7	115,953	13	10
1864	475	6,790,244	5,671,545	137,214	12	4	126,540	11	10
1865	525	7,485,803	6,037,529	135,355	4	9	129,491	18	5

198. The postal revenue for 1865 shows a slight apparent falling-off. This was in consequence of the stamps supplied to Government departments having been included in the income of all the previous years. The use of

Post-office stamps for official letters has been discontinued since the latter part of 1864. They are now franked by means of a departmental stamp imprinted upon the envelopes.

199. The postage fee upon town letters in Victoria is 2d. for the half-ounce, and upon each newspaper 1d. Prior to the 1st August, 1866, the rate for country letters was 4d., but on and after that date, which was that of the Post-office Statute, 1866 (29th Vict., No. 298), coming into operation, the fee for country as well as town letters has been 2d. the half-ounce.

MONEY ORDERS.

200. The money-order system was introduced in 1858, under the provisions of an Act of the Colonial Legislature (21 Vict., No. 60). Money orders are now issued and paid at 102 places within the colony. They are also issued upon places in Great Britain and Ireland, New South Wales, New Zealand, South Australia, Western Australia, Queensland, and Tasmania. Orders issued at these places are also paid in Victoria. The total number of orders issued since the system was founded has been 180,585, and the amount £696,173 3s. 7d. The total number of orders paid during the same period has been 152,553, and the amount £588,545 7s. 5d.

201. The following table, giving the number of Money Order Offices in Victoria, and the number of orders issued and paid during each year since its commencement, shows the growth of the system :—

TABLE XL.—MONEY ORDERS, 1858-1865.

Year.	Number of Money Order Offices in Victoria.	Money Orders Issued.				Money Orders Paid.			
		Number.	Amount.			Number.	Amount.		
			£	s.	d.		£	s.	d.
1858	14	2,858	12,597	18	10	2,754	12,253	4	4
1859	19	8,898	36,299	1	10	8,793	36,009	5	1
1860	25	10,571	41,916	5	7	10,512	41,907	19	0
1861	39	13,704	52,629	6	5	13,578	51,753	[illegible]	1
1862	57	23,600	93,752	11	[illegible]	16,661	62,181	14	6
1863	76	31,262	123,838	17	4	26,799	106,629	16	[illegible]
1864	[illegible]	39,026	148,283	13	5	32,341	124,153	[illegible]	4
1865	102	50,666	186,855	8	[illegible]	41,115	153,657	8	1

202. The following are the numbers and amounts of money orders issued in Victoria upon places within and without the colony during the year 1865, and the numbers and amounts of money orders issued at places within and without the colony and paid in Victoria during the year 1865 :—

TABLE XLI.—MONEY ORDERS ISSUED AND PAID, 1865.

Money Orders Issued at and upon Places in	Money Orders Issued in Victoria.				Money Orders Paid in Victoria.			
	Number.	Amount.			Number.	Amount.		
		£	s.	d.		£	s.	d.
Victoria	33,422	119,097	6	1	33,334	118,901	5	0
Great Britain and Ireland	14,934	57,372	15	10	2.157	9,007	14	2
New South Wales	932	4,067	11	11	1,375	5,992	1	1
New Zealand	483	2,619	19	2	2,283	10,920	10	1
South Australia	420	1,691	1	3	984	3,980	3	6
Western Australia	29	139	17	11	108	809	12	2
Queensland	184	839	14	10	589	2,841	2	3
Tasmania	262	1,027	1	5	285	1,204	19	10
Total	50,666	186,855	8	5	41,115	153,657	8	1

ELECTRIC TELEGRAPHS.

203. To Victoria the credit is due of having laid the first line of electric telegraph in the southern hemisphere. This was the line from Melbourne to Williamstown, which was commenced in 1853, and opened on the 1st March, 1854. There is now not only a network of telegraphic communication between the metropolis and every town of importance in the colony, but wires are also carried over the borders, and connected with those of the adjacent colonies leading to the capitals of South Australia, New South Wales, and Queensland. A submarine telegraphic cable was laid in 1859 across Bass's Straits, from Victoria to Tasmania, and was for a short time worked successfully. It soon, however, became damaged and unworkable, in consequence of the rocky nature of the bottom; and since then no attempt has been made to renew the communication.

204. The Victorian lines were all constructed and are still worked by the Government. In consequence of this, messages on public service of course travel free. Upwards of 3000 miles of wire were opened to the end of 1865. Along this, close upon 280,000 messages were transmitted within the year.

205. The following table shows the number of stations, the number of miles of wire, the number of paid and unpaid telegrams, and the amount received for the former, during each of the last six years.

TABLE XLII.—ELECTRIC TELEGRAPHS, 1860-1865.

YEAR.	Number of Stations.	Number of Miles of Wire.	NUMBER OF TELEGRAMS. Paid.	Unpaid.	Total.	Amount Received. £	s.	d.
1860	33	...	117,953	48,850	166,803	24,440	15	1
1861	47	...	143,870	40,818	184,688	24,361	15	5
1862	57	...	162,647	49,038	211,685	25,883	2	2
1863	66	2585½	156,482	78,038	234,520	24,732	16	7
1864	70	2626½	184,441	71,939	256,380	29,121	18	1
1865	[illegible]	3110½	210,777	68,964	279,741	34,770	2	10

RAILWAYS.

206. Railways in Victoria, except the short lines which connect Melbourne with its immediate suburbs, are the property of the State, and are worked by Goverument officials. They were all constructed by the Government, with the above exception, and also with that of the Melbourne and Geelong line, which was made by a private company and afterwards purchased by the Government.

207. Funds for the construction of the Government lines, and also for the purchase of the Melbourne and Geelong line, were provided by the issue of debentures. Particulars respecting these will be found under the heading "Public Debt," par. 249, *post.*

The following are the lengths of the Government lines:—

Melbourne and Sandhurst	101 miles
Melbourne, Geelong, and Ballarat	[illegible] ,,
Williamstown Branch	9 ,,
Sandhurst and Echuca	46 ,,
Total	254

The private railways are of the following lengths:—

Melbourne and St. Kilda	3¼ miles
Melbourne and Sandridge	2¼ ,,
Melbourne and Prahran	3½ ,,
Richmond and Hawthorn	2 ,,
Prahran and Brighton	5¼ ,,
Melbourne and Essendon (not used at present)	5 ,,
Total	22 ,,

208. There are thus 276 miles of railway completed in Victoria. The lines are all in full operation, except that between Melbourne and Essendon. This short railway was worked for some years, but for various reasons traffic on it has been discontinued. Offers have been made to the Government to purchase this line.

209. The total cost of constructing these lines, and the average cost per mile, were as follow:—

	Total cost.	Average per mile.
Government Lines	£8,960,431 14 6	£35,277 5 10
Private Lines, exclusive of the Essendon Line	818,199 12 7	48,130 0 0
Essendon Line	71,728 0 0	14,345 12 0
Total	£9,850,359 7 1	£35,689 14 1

210. The following were the numbers of the different descriptions of rolling stock in use at the end of 1865:—

TABLE XLIII.—ROLLING STOCK, 1865.

DESCRIPTION.	On Government Lines.	On Private Lines.	Total.
Locomotives	77	15	92
First-class and composite carriages	69	54	123
Second-class carriages	71	10	81
Goods-trucks, waggons, &c.	942	149	1091
Sheep and cattle trucks	104	...	104
Other trucks, vans, &c.	110	10	120

211. The value of rolling stock upon Government lines was £605,500, and on private lines £107,588; making a total of £713,088.

212. The passenger rates are computed at per mile upon the following scale:—

	First Class. d.	Second Class. d.
Government Lines, single	2·287	1·701
Private Lines, ,,	2½	1¾
,, ,, return	2	1½

213. The number of passengers carried in 1865 was as follows:—

TABLE XLIV.—PASSENGER TRAFFIC, 1865.

YEAR 1865.	SINGLE.		RETURN.		PERIODICAL.	
	First Class.	Second Class.	First Class.	Second Class.	First Class.	Second Class.
Government Lines	108,861½	337,281½	195,878	424,157	...	...
Private Lines	592,234	390,675	667,455	605,500	15,993	2,899
Total	701,095½	727,956½	863,333	1,029,657	15,993	2,899

214. The following weight of goods was carried in 1865 :—

	Tons	cwts.	qrs.	lbs.
Government Lines	339,812	0	1	23
Private Lines	163,532	10	1	13
Total	503,344	10	3	8

215. The following table shows the amount of passenger and goods traffic which has taken place upon Government and private lines during each of the last six years :—

TABLE XLV.—TRAFFIC ON RAILWAYS, 1860-1865.

Year.	Number of Passengers Carried.*			Weight of Goods Carried.		
	Government Lines.	Private Lines.	Total.	Government Lines.	Private Lines.	Total.
				Tons.	Tons.	Tons.
1860 ...	702,341	1,762,717	2,465,058	110,314	168,177	278,491
1861 ...	809,111	2,115,296	2,924,407	170,214	156,523	326,737
1862 ...	817,908	2,197,779	3,015,687	216,722	156,745	373,467
1863 ...	807,274	2,254,378	3,061,652	275,497	164,248	439,745
1864 ...	963,830	2,397,476	3,361,306	313,582	168,733	482,315
1865 ...	1,066,177	2,274,756	3,340,933	339,811	163,532	503,343

216. The following were the receipts during the year 1865 upon Government and private railways, specifying the amounts derived from the passenger and goods traffic and from sundries :—

TABLE XLVI.—RAILWAY RECEIPTS, 1865.

Year 1865.	Receipts.								
	Government Lines.			Private Lines.			Total.		
	£	s.	d.	£	s.	d.	£	s.	d.
Passenger Fares	223,098	19	0	91,617	2	6	314,716	1	6
Freight on Goods	318,809	9	5	37,403	10	2	356,212	19	7
Sundries	44,989	7	4	1,243	8	9	46,232	16	1
Total	586,897	15	9	130,264	1	5	717,161	17	2

217. The receipts from all sources upon Government and private railways during each of the last six years are given in the following table :—

TABLE XLVII.—RAILWAY RECEIPTS, 1860-1865.

Year.	Total Receipts.		
	Government Lines.	Private Lines.	Total.
	£	£	£
1860	102,329	109,228	211,557
1861	174,379	117,003	291,382
1862	321,219	114,521	435,740
1863	463,563	116,357	579,920
1864	515,707	130,882	646,589
1865	586,898	130,263	717,161

* Return and Periodical, as well as Single Passengers, have been counted as Single for the purpose of these three columns.

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218. Trains upon Government lines travelled 1,135,745 miles in 1865; and upon private lines, 341,578 miles. The total number of miles travelled during the year was thus 1,477,323.

COACHES.

219. Stage Coaches run to all parts of the colony, except those for which railway communication is available. It is calculated that upwards of 2000 miles of road are traversed daily by this description of conveyance, and that 60 coaches and more than 1500 horses are engaged in the traffic. As the average value of each coach is £100, and that of each horse is £10, at least £21,000 must be invested in horses and conveyances alone.

IMPORTS AND EXPORTS.

220. The Imports and Exports in the year 1865 were each slightly above thirteen millions sterling in value. These amounts show a falling off as compared with previous years, especially as regards the imports, which have not been so low since 1855. The years in which the value of imports was greatest were 1854 and 1857, in both of which they exceeded £17,000,000. The value of exports was greatest in 1856 and 1857, in both of which they were above £15,000,000.

221. In 1853, the imports were of the enormous value of upwards of £81 to every man, woman, and child in the colony, and in the subsequent year they amounted to over £66 to each inhabitant. In 1865, they amounted to only £21 10s. 2d. per head, which is less than in any other year since the gold discoveries. The value of exports per head was greatest in 1852 and 1853, in which respectively they amounted to £56 1s. 4d. and £56 12s. 4d. Since the discovery of gold they have never been so low in any year as in 1865, when they only amounted to £21 6s. 8d. per head.

222. The following table gives the mean population, value of imports, and value of exports for each year, from that of the separation of Port Phillip from New South Wales to the end of 1865; also the value of imports and exports per head of the population during each year.

Table XLVIII.—Population, Imports, Exports, 1851-1865.

Year.	Estimated Mean Population.	Imports.				Exports.			
		Total Value.	Value per head of the Population.			Total Value.	Value per head of the Population.		
		£	£	s.	d.	£	£	s.	d.
1851	86,825	1,056,437	12	3	4	1,422,909	16	7	9
1852	132,905	4,069,742	30	12	5	7,451,549	56	1	4
1853	195,378	15,842,637	81	1	9	11,061,544	56	12	4
1854	267,371	17,659,051	66	0	11	11,775,204	44	0	10
1855	338,315	12,007,939	35	9	10	13,493,338	39	17	8
1856	380,942	14,962,269	39	5	6	15,489,760	40	13	3
1857	430,347	17,256,209	40	2	0	15,079,512	35	0	10
1858	483,827	15,108,249	31	4	6	13,989,209	28	18	3
1859	517,226	15,622,891	30	4	1	13,867,859	26	16	3
1860	539,337	15,093,730	27	19	8	12,962,704	24	0	8
1861	541,012	13,532,452	25	0	3	13,828,606	25	11	3
1862	548,450	13,487,787	24	11	10	13,039,422	23	15	6
1863	561,322	14,118,727	25	3	0	13,566,296	24	3	4
1864	589,160	14,974,815	25	8	4	13,898,384	23	11	10
1865	616,375	13,257,537	21	10	2	13,150,748	21	6	8

GOLD.

223. The exports of gold, the produce of Victoria in 1865, amounted to 1,543,149 ounces. This quantity was about 2249 ounces short of that in 1864. The total quantity of Victorian gold which passed through the Customs of this and the adjacent colonies since the first opening of the goldfields, amounts to 32,272,793 ozs., representing, at £4 per ounce, a value of £129,091,172. The following are the quantities exported in each year :—

TABLE XLIX.—NET EXPORTS OF VICTORIAN GOLD, 1851-1865.

Year.	Quantity.			Year.	Quantity.		
	Ozs.	dts.	grs.		Ozs.	dts.	grs.
1851	145,137	3	12	Brought forward	19,494,185	1	16
1852	2,738,484	0	13	1859	2,280,678	3	0
1853	3,150,020	14	16	1860	2,156,660	12	0
1854	2,392,065	9	19	1861	1,967,413	11	0
1855	2,793,065	8	16	1862	1,658,241	17	0
1856	2,985,695	17	0	1863	1,627,066	7	0
1857	2,761,528	8	0	1864	1,545,398	3	0
1858	2,528,187	19	12	1865	1,543,148	19	0
Total	19,494,185	1	16	Total	32,272,792	13	16

224. In addition to the above, there was probably 150,000 ounces lodged in the Victorian Treasury, and in the hands of the Colonial banks and gold-brokers, at the end of 1865. It was estimated some years ago, by one of the principal Melbourne gold-brokers, who had every opportunity of being well informed on the subject, that from the first discovery of gold to the end of 1859, 1,931,869 ounces had been taken out of the colony by private hands, without being passed through the Customs. This estimate, brought down to the end of 1865, in the same proportion as the gold appearing in the Customs returns, would make the total quantity of unrecorded gold taken out of the colony from the commencement to that date, equal to 2,863,247 ounces, which, being added to that which passed through the Customs and that in possession of the Treasury, banks, &c., would make the total produce of the Victorian goldfields, to the end of 1865, amount to 35,286,040 ounces, which, at £4 per ounce, would represent a value of £141,144,160.

WOOL.

225. During 1865 the gross exports of wool amounted to upwards of 44,000,000 lbs., the official value of which was about £3,300,000. During the same year nearly 4,000,000 lbs., of a value of little less than a quarter of a million sterling, were imported from the adjacent colonies. The net exports of wool were, therefore, about 40,000,000 lbs., valued at rather more than three millions sterling.

226. The following table shows the net quantity and value of exported wool, after deducting imports of the same, in each year, since the founding of the colony ; also, the total during the whole period of 29 years :—

TABLE L.—NET EXPORTS OF WOOL, 1837-65.

Year.	Balance of Exports of Wool over Imports.		Year.	Balance of Exports of Wool over Imports	
	Quantity.	Value.		Quantity.	Value.
	lbs.	£		lbs.	£
1837	175,081	11,639	Brought forw'd	97,736,352	4,764,712
1838	320,383	21,631	1852	20,036,749	1,062,187
1839	615,603	45,226	1853	20,831,084	1,651,226
1840	941,815	67,302	1854	22,884,609	1,611,763
1841	1,714,711	85,735	1855	22,296,270	1,388,793
1842	2,828,784	151,446	1856	21,693,411	1,488,322
1843	3,826,602	201,383	1857	15,940,827	1,239,166
1844	4,326,229	174,944	1858	20,775,217	1,620,598
1845	6,841,813	396,537	1859	20,738,714	1,702,115
1846	6,406,950	351,441	1860	23,316,480	1,957,777
1847	10,210,038	565,805	1861	22,640,745	2,001,681
1848	10,524,663	556,521	1862	23,513,938	2,231,677
1849	14,567,005	574,594	1863	24,252,839	1,964,265
1850	18,091,207	826,190	1864	32,855,633	2,707,398
1851	16,315,468	734,618	1865	40,423,494	3,088,343
Carried forw'd	97,736,352	4,764,712	Total	429,936,362	30,480,023

227. The gross exports of wool during the whole period, from 1839 to 1865, amounted to 449,695,704 lbs., valued at £31,866,652; the gross imports of wool to 19,759,342 lbs., valued at £1,386,629. The balance, therefore, being the wool actually produced in Victoria, and exported through the Customs, was 429,936,362 lbs., of a value of £30,480,023, as shown above.

TALLOW.

228. The exports of tallow during 1865 amounted to something over a million pounds weight, of a value of upwards of £15,000. They were only slightly in excess of the imports, which unusual circumstance is, no doubt, attributable to the increased demand which exists for tallow for manufacturing purposes within the colony. The net exports of tallow were lower during 1865, as regards quantity, than they were in any previous year since 1846, and lower, as regards value, than in any previous year since 1839. These results will be observed in the following table :—

TABLE LI.—NET EXPORTS OF TALLOW, 1837-65.

Year.	Balance of Exports of Tallow over Imports.		Year.	Balance of Exports of Tallow over Imports.	
	Quantity.	Value.		Quantity.	Value.
	lbs.			lbs.	
1837	2,240	428	Brought forw'd	33,924,023	£444,192
1838	18,111	489	1852	4,469,248	60,261
1839	18,552	306	1853	982,833	13,251
1840	48,018	953	1854	1,340,304	22,738
1841	41,900	786	1855	1,321,600	28,061
1842	78,400	975	1856	1,966,976	34,580
1843	117,258	1,700	1857	4,836,384	62,301
1844	961,032	13,907	1858	2,275,576	43,948
1845	846,155	12,267	1859	501,312	9,054
1846	250,880	3,049	1860	727,328	17,586
1847	1,255,181	15,797	1861	4,187,624	75,402
1848	3,013,808	37,968	1862	3,925,768	64,981
1849	7,800,716	100,261	1863	1,912,888	38,424
1850	10,009,216	132,418	1864	3,819,984	59,216
1851	9,459,520	123,203	1865	878,000	550
Carried forw'd	33,924,023	£444,192	Total	66,501,148	£969,545

229. The gross quantity of tallow exported in the whole 29 years has amounted to 67,992,484 lbs., and its value to £992,945. The gross quantity imported in the same period has amounted to 1,491,336 lbs., valued at £23,400. The excess of the former over the latter, being the net exports of tallow, was thus 66,501,148 lbs., of an official value of £969,545, as shown in the table. This, however, does not, as in the case of the wool, of which there are no local manufactures, represent the whole quantity produced in the colony, since, for many years past, the manufacture of soap, candles, &c., has been a Victorian industry of considerable importance.

HIDES AND SKINS.

230. The value of hides and skins exported during 1865 was about £83,000; that of those imported was about £3000. The net exports thus amounted, in money value, to £80,000. The following table shows the value of the net exports of hides and skins in each year from the first settlement of Port Phillip.

TABLE LII.—NET EXPORTS OF HIDES AND SKINS, 1837-65.

Year.	Value of Balance of Exports of Hides and Skins over Imports.	Year.	Value of Balance of Exports of Hides and Skins over Imports.
1837	£22	Brought forward	£24,982
1838	117	1852	13,306
1839	249	1853	11,811
1840	48	1854	29,465
1841	298	1855	41,665
1842	801	1856	71,092
1843	743	1857	186,409
1844	739	1858	103,873
1845	1,756	1859	169,917
1846	2,159	1860	140,967
1847	3,149	1861	96,784
1848	1,835	1862	126,701
1849	1,549	1863	101,822
1850	4,582	1864	97,806
1851	6,935	1865	80,170
Carried forward	£24,982	Total	£1,296,770

231. The total value of exports of hides and skins, during the whole period, was £1,334,705; that of imports of the same article was £37,935, leaving the net value of the exports at £1,296,770. In addition to the hides and skins exported, a certain quantity are each year tanned in the colony for home consumption.

TARIFF.

232. The Victorian Tariff has recently been changed, under the Act 29 Victoria. No. 293, with the view of placing light import duties upon articles which are capable of being produced or manufactured in Victoria, in lieu of the old system, under which but little direct encouragement was given to native industry.

233. The following is a list of the dutiable articles, with the rates charged under the old tariff and under the one now in force :—

TABLE LIII.—VICTORIAN TARIFF, PRIOR TO AND SUBSEQUENT TO THE 12TH APRIL, 1866.

ARTICLES SUBJECT TO DUTY.	RATE OF DUTY. Prior to 12th April, 1866.	RATE OF DUTY. Subsequent to 12th April, 1866.
IMPORT DUTIES.		
Ale, Porter, Spruce and other Beer, Cider and Perry, per gallon ...	6d.	6d.
Cigars, per lb.	5s.	5s.
Coffee and Chicory, per lb. ...	2d.	2d.
Cocoa and Chocolate, per lb. ...	...	2d.
Molasses and Treacle, per cwt...	3s.	3s.
Spirits, or Strong Waters of any strength, not exceeding the strength of proof by Sykes's hydrometer, and so on in proportion for any greater or less strength than the strength of proof, per gallon ...	10s.	10s.
Spirits, Cordials, Liquors, or Strong Waters, sweetened or mixed with any article, so that the degree of strength cannot be ascertained by Sykes's hydrometer, per gallon...	10s.	10s.
Spirits, perfumed, per gallon ...	10s.	10s.
Wine, per gallon ...	2s.	3s.
Sugar, per cwt. ...	6s.	3s.
Tea, per lb....	6d.	3d.
Tobacco and Snuff, per lb.	2s.	2s.
Tobacco, unmanufactured, per lb.	1s.	1s.
" sheepwash, per lb.	3d.	3d.
Opium, raw, per lb.	10s. }	10s.
" refined, per lb. ...	20s. }	
Rice, per cwt.	2s.	2s.
Dried Fruits, per cwt. ...	10s.	—
Dried and Preserved Fruits and Vegetables, Nuts of all kinds (not including Cocoa Nuts), Butter, Cheese, Candles, Bacon, Lard, Hams, Starch, Soap, Confectionery, Biscuits, Comfits, Sweetmeats, Succades, Jams, Macaroni, Vermicelli, Maizena, Preserved Meats and Fish, per lb. ...	...	1d.
Malt, per bushel...	1d.	6d.
Hops, per lb.	2d.	2d.
Salt, per ton	...	20s.
Vinegar, per gallon	...	6d.
Varnish	...	2s.
Salted Provisions, including Fish not otherwise enumerated, and not caught from vessels owned in the colony, per cwt.	...	5s.
Doors, each	...	1s.
Window Sashes, per pair	...	1s.
Plate of Gold, per oz. troy	...	8s.
Plate of Silver "	...	1s.
Barley, per bushel	...	3d.
Oats "	...	3d.
Millinery, and all articles made up from fabrics of silk, or of silk mixed with other materials, per cubic foot ...	...	7s.
Apparel and Slops, and all articles made up wholly or in part from fabrics of wool, cotton, linen, or mixed materials (except corn or wool bags); Boots, Shoes, Hosiery, and Gloves; Hats, Caps, and Bonnets (untrimmed); Saddles, Harness, and Leatherware, per cubic foot ...	...	4s.
Watches, Jewels, and Jewellery of all kinds, Manufactures of Silk, or of mixed materials of which the greater part is silk, Musical Instruments, Carriages, Glass and Glassware, Chinaware and Porcelain, Furniture, Toys and Turnery, Woodenware, Brushware, and Wickerware, Earthenware, Oilmen's Stores not otherwise enumerated (except Oils in bulk, Tapioca, Sago, Arrowroot, Spices, Pepper, and Ginger), Woollen Blankets and Rugs, ad valorem ...	...	10 per cent.
EXCISE DUTIES.		
Spirits distilled in Victoria, from malt, grain, roots, grapes, or wine, per gallon ...	6s.	6s.
Spirits distilled from sugar, treacle, molasses, wort, wash, or spent-wash, with which sugar, treacle, or molasses has been made or mixed, or from beer or ale, per gallon ...	8s.	8s.
EXPORT DUTY.		
Gold, per oz. ...	1s. 6d.	*

* 1s. until 31st December, 1866; 6d. from and after that date to 31st December, 1867; after which it is to cease and determine.

WAGES.

234. It is a remarkable fact that the rates of wages in Victoria have always been highest when the number of arrivals has been greatest; and in years when immigration has fallen off, there has been a corresponding depression in the remuneration paid for labour. Thus, in the years 1852, 1853, and 1854, in which respectively the large numbers of 95,000, 92,000, and 83,000 immigrants arrived, the prices of labour were higher than at any other period in the history of the colony. In the four succeeding years, as fewer people arrived—viz., 67,000, 42,000, 74,000, and 56,000 respectively, wages declined somewhat, but still continued high. Since then, only about 30,000 persons upon the average have arrived in each year, and coincident therewith the rates of labour, although above those obtaining in older countries, and perhaps also higher than those paid in any other British colony, have become low as compared with those which ruled when a more active immigration prevailed. It is further worthy of remark, that the only class whose wages has not fallen to any great extent has been that of female domestic servants, and that the introduction of single females is the only description of immigration which steadily throughout the whole period, since the gold discoveries, has met with direct encouragement from every Government.

235. The following are about the average rates in Melbourne, paid at four different periods :—

Table LIV.—Rates of Wages in Melbourne, 1854-65.

Description of Labour.	1854. £ s. d. to £ s. d.	1857. £ s. d. to £ s. d.	1861. £ s. d. to £ s. d.	1865. £ s. d. to £ s. d.
Agricultural Labour.				
Farm labourers, per week, with rations ...	1 13 0 to 1 15 0	1 2 0 to 1 5 0	0 15 0 to 1 0 0	0 12 0 to 0 18 0
Ploughmen "	1 15 0 to 2 0 0	1 3 0 to 1 10 0	1 0 0 to 1 3 0	0 18 0 to 1 0 0
Reapers, per acre, with rations	1 5 0 —	1 5 0 —	0 15 0 —	0 10 0 to 0 12 0
Mowers " "	0 10 0 —	0 8 0 —	0 6 0 —	0 3 0 to 0 4 0
Threshers, per bushel, with rations	0 1 0 —	0 0 9 —	0 0 6 —	0 0 4 to 0 0 5
Pastoral Labour.				
Shepherds, per annum, with rations	43 0 0 to 48 0 0	35 0 0 to 38 0 0	30 0 0 to 35 0 0	30 0 0 to 35 0 0
Stockkeepers " "	60 0 0 to 65 0 0	40 0 0 to 60 0 0	35 0 0 to 50 0 0	35 0 0 to 45 0 0
Hutkeepers " "	35 0 0 to 40 0 0	28 0 0 to 33 0 0	25 0 0 to 30 0 0	25 0 0 to 30 0 0
Generally useful men on stations, per week, with rations	1 13 0 to 1 15 0	1 0 0 —	0 15 0 to 0 18 0	0 14 0 to 0 18 0
Sheep-washers, per week, with rations ...	1 8 0 —	1 0 0 —	0 18 0 —	0 15 0 —
Shearers, per 100 sheep shorn, with rations	1 0 0 —	0 17 0 —	0 15 0 —	0 13 0 to 0 14 0
Artisan Labour.				
Masons, per day, without rations	1 0 0 to 1 10 0	0 16 0 —	0 12 0 to 0 14 0	0 8 0 to 0 10 0
Plasterers " "	1 5 0 to 1 15 0	0 15 0 —	0 9 0 to 0 11 0	0 8 0 to 0 10 0
Bricklayers " "	1 0 0 to 1 10 0	0 15 0 —	0 10 0 to 0 12 0	0 8 0 to 0 10 0
Carpenters " "	1 0 0 to 1 8 0	0 14 0 —	0 10 0 to 0 11 6	0 7 0 to 0 9 0
Blacksmiths	1 0 0 to 1 5 0	0 13 0 to 0 14 0	0 9 0 to 0 11 0	0 8 0 to 0 10 0
Servants—Males and Married Couples.				
Married couples, without family, per annum, with board and lodging	90 0 0 to 115 0 0	70 0 0 to 80 0 0	60 0 0 to 70 0 0	50 0 0 to 60 0 0
Married couples, with family, per annum, with board and lodging	70 0 0 to 95 0 0	60 0 0 to 70 0 0	50 0 0 to 65 0 0	40 0 0 to 50 0 0
Men cooks, on farms and stations, per week, with board and lodging	1 10 0 to 2 5 0	1 5 0 to 1 15 0	1 0 0 to 1 5 0	0 15 0 to 1 5 0
Grooms, per annum, with board and lodging	65 0 0 to 85 0 0	45 0 0 to 60 0 0	40 0 0 to 55 0 0	40 0 0 to 50 0 0
Gardeners " " ...	80 0 0 to 90 0 0	55 0 0 to 65 0 0	52 0 0 to 60 0 0	40 0 0 to 50 0 0
Servants—Females.				
Cooks, per annum, with board and lodging ...	45 0 0 to 55 0 0	40 0 0 to 50 0 0	40 0 0 to 45 0 0	35 0 0 to 40 0 0
Laundresses, per annum " ...	35 0 0 to 50 0 0	35 0 0 —	30 0 0 to 35 0 0	30 0 0 to 35 0 0
General servants " " ...	30 0 0 to 35 0 0	28 0 0 to 35 0 0	25 0 0 to 30 0 0	25 0 0 to 30 0 0
Housemaids " " ...	28 0 0 to 32 0 0	26 0 0 to 30 0 0	25 0 0 to 30 0 0	25 0 0 to 30 0 0
Nursemaids " " ...	20 0 0 to 25 0 0	18 0 0 to 25 0 0	18 0 0 to 25 0 0	18 0 0 to 25 0 0
Miscellaneous Labour.				
General labourers, per day, without rations ...	0 10 0 to 0 13 0	0 7 0 to 0 9 0	0 7 0 to 0 7 6	0 5 0 to 0 7 0
Stone-breakers, per cubic yard " ...	0 9 0 to 0 10 0	0 4 6 to 0 5 0	0 3 9 to 0 4 9	0 3 0 to 0 4 6
Seamen, per month, with rations	9 0 0 to 10 0 0	5 0 0 to 6 0 0	4 0 0 —	4 0 0 to 4 10 0

236. In country districts, as a rule, the rates of labour are higher than they are in Melbourne, especially as regards skilled artisans, whose wages, in some inland towns, are quoted as high as 12s. per day all round. Female servants also usually receive from £3 to £5 per annum more in the country than in the metropolis. Miners' wages upon the goldfields range from 35s. per week, in some localities, to 60s. in others—in all cases without rations. The recognised working day of artisans and labourers throughout Victoria is eight hours.

PRICES.

237. Although the prices of articles of general consumption have become greatly reduced since the gold discoveries, yet owing to a variety of causes, the chief one being the protracted drought which has prevailed during the last two years, they have been for some time past somewhat higher than usual. Since the rains have set in, however, they have shown a tendency to fall, and, as regards food, will, it is hoped, rule lower for a long time to come.

238. The following are about the average prices which have been paid for the leading commodities in Melbourne during the same four years for which rates of wages have been given. It may be remarked that the prices of meat, vegetables, &c., are generally lower in country districts than in Melbourne, but that bread and flour, as a rule, are cheaper in the metropolis.

TABLE LV.—AVERAGE PRICES IN MELBOURNE, 1854-65.

ARTICLES.	1854.	1857.	1861.	1865.
	£ s. d. £ s. d.	£ s. d. £ s. d.	£ s. d. £ s. d.	£ s. d. £ s. d.
AGRICULTURAL PRODUCE.				
Wheat, per bushel ...	0 12 6 to 0 16 0	0 6 3 to 0 10 0	0 5 6 to 0 7 6	0 8 6 to 0 10 0
Barley ,,	0 7 3 to 0 10 6	0 5 9 to 0 11 0	0 5 9 to 0 6 9	0 4 0 to 0 5 0
Oats ,,	0 10 6 to 0 16 0	0 7 6 to 0 13 0	0 4 0 to 0 4 2	0 4 0 to 0 5 9
Hay, per ton...	14 0 0 to 48 0 0	9 0 0 to 25 0 0	6 10 0 to 8 0 0	6 0 0 to 9 0 0
Flour (first quality), per ton	33 0 0 to 35 0 0	16 0 0 to 26 0 0	14 0 0 to 18 10 0	20 0 0 to 25 0 0
Bread, per 4-lb. loaf	0 1 6 to 0 1 9	0 0 10 to 0 1 0	0 0 7½ to 0 0 10	0 0 9 to 0 1 0
FARM-YARD AND DAIRY PRODUCE.				
Butter (colonial), retail, per lb. ...	0 3 9 to 0 5 6	0 2 6 to 0 3 0	0 0 11 to 0 1 6	0 2 0 to 0 3 0
Cheese, per lb.	None	None	0 0 10 —	0 0 7 to 0 1 5
Milk, per quart	0 1 6 to 0 2 6	0 1 0 —	0 0 6 to 0 0 10	0 0 6 to 0 0 7
Geese, per couple	2 0 0 to 3 0 0	1 0 0 to 1 10 0	0 13 0 to 0 17 0	0 9 0 to 0 12 0
Ducks ,,	1 0 0 to 1 4 0	0 8 6 to 0 13 0	0 5 0 to 0 9 0	0 4 6 to 0 7 0
Fowls ,,	0 18 0 to 1 0 0	0 7 0 to 0 11 0	0 5 0 to 0 7 6	0 4 6 to 0 6 0
Rabbits ,,	— —	0 3 0 to 0 8 6	0 4 9 to 0 6 0	0 4 0 to 0 5 0
Pigeons ,,	— —	0 4 0 to 0 5 0	0 2 0 —	0 2 0 to 0 3 0
Turkeys, each	1 0 0 to 2 0 0	0 15 0 to 1 10 0	0 8 0 to 0 13 0	0 10 0 to 0 15 0
Sucking pigs, each ...	— —	— —	0 8 0 to 0 9 0	0 6 0 to 0 10 0
Bacon, per lb.	0 1 0 to 0 1 1	0 0 11 to 0 1 0	0 0 9½ to 0 0 11	0 0 9 to 0 1 5
Ham ,,	0 1 0 to 0 1 2	0 1 0 to 0 1 2	0 0 11 to 0 1 1	0 0 10 to 0 1 7
Eggs, per dozen	0 4 0 to 0 8 0	0 2 9 to 0 4 0	0 1 3 to 0 3 0	0 2 0 to 0 3 6
GARDEN PRODUCE.				
Potatoes, wholesale, per ton	23 0 0 to 31 0 0	10 10 0 to 21 0 0	4 10 0 to 6 0 0	5 0 0 to 6 0 0
,, retail, per lb.	0 0 3 to 0 0 6	0 0 2 to 0 0 4	0 0 1 to 0 0 2	0 0 1 to 0 0 1½
Onions, dried, per cwt.	5 10 0 to 10 0 0	0 11 0 to 0 17 0	0 8 0 to 1 0 0	0 10 0 to 1 0 0
Carrots, per dozen bunches	0 5 0 to 0 9 0	0 2 3 to 0 3 6	0 0 9 to 0 1 0	0 0 9 to 0 1 6
Turnips ,,	0 4 0 to 0 7 0	0 2 0 to 0 4 0	0 0 10 to 0 2 6	0 0 9 to 0 2 6
Radishes ,,	0 5 0 to 0 7 0	0 1 0 to 0 1 6	0 0 6 to 0 0 9	0 0 4 to 0 0 8
Cabbages, per dozen	0 12 0 to 2 0 0	0 6 6 to 0 10 0	0 2 0 to 0 4 6	0 2 0 to 0 12 0
Cauliflowers ,,	0 12 0 to 2 0 0	0 8 6 to 0 10 0	0 2 6 to 0 5 0	0 2 0 to 0 15 0
Lettuces ,,	0 4 6 to 0 6 0	0 1 9 to 0 2 9	0 0 8 to 0 1 0	0 0 6 to 0 2 0
MISCELLANEOUS ARTICLES.				
Butchers' Meat—Beef, per lb.	0 0 7 to 0 0 9	0 0 7 to 0 0 9	0 0 3½ to 0 0 4½	0 0 4 to 0 0 9
,, Mutton ,,	0 0 7 to 0 0 10	0 0 7 —	0 0 3½ —	0 0 4 to 0 0 8
,, Veal ,,	0 0 9 to 0 1 4	0 0 10 —	0 0 7½ to 0 0 8½	0 0 7 to 0 0 9
,, Pork ,,	0 1 0 to 0 1 8	0 1 0 —	0 0 8½ to 0 0 9½	0 0 6 to 0 0 10
,, Lamb, per quarter ...	0 6 0 —	0 4 6 to 0 5 6	0 3 9 to 0 4 0	0 4 0 to 0 5 0
Tea (duty paid), per chest	4 5 0 to 6 10 0	4 0 0 to 9 10 0	6 0 0 to 11 10 0	6 0 0 to 10 0 0
Coffee (in bond), per lb.	0 0 7 to 0 0 9	0 0 9 to 0 1 0	0 1 1 to 0 1 3	0 0 10 to 0 1 0
Sugar, coarse (duty paid), per ton	24 0 0 to 30 0 0	34 0 0 to 45 0 0	23 0 0 to 36 0 0	27 0 0 to 40 0 0
,, refined, per cwt.	31 0 0 to 53 0 0	45 0 0 to 65 0 0	34 0 0 to 48 0 0	48 0 0 to 57 0 0
Rice, per lb. ...	0 0 4½ to 0 0 5	0 0 2½ to 0 0 4	0 0 3 to 0 0 4	0 0 3 to 0 0 5
Tobacco (in bond), per lb...	0 2 2 to 0 2 3	0 1 4 to 0 1 6	0 1 7 to 0 2 0	0 0 9 to 0 3 6
Soap, colonial, per cwt.	1 16 0 to 2 3 0	2 1 0 to 2 3 0	1 13 0 to 1 16 0	1 9 0 to 1 10 0
Candles, tallow, per lb.	0 0 7 to 0 0 10	0 0 7 —	0 0 6 to 0 0 7	0 0 6 to 0 0 8
,, sperm ,,	0 1 7 to 0 1 10	0 1 5 to 0 2 2	0 1 3 to 0 1 5	0 0 9 to 0 1 1
Salt, per ton...	5 0 0 to 8 0 0	2 0 0 to 3 10 0	4 5 0 to 5 0 0	3 10 0 to 4 10 0
Coals ,,	4 0 0 to 6 0 0	1 18 0 to 2 14 0	2 0 0 to 3 10 0	1 15 0 to 2 2 0
Firewood, per ton ...	1 17 6 to 2 10 0	1 5 0 to 1 10 0	0 15 0 to 0 17 6	0 10 0 to 0 12 0

239. The rent of a cottage, suitable for a labouring man and his family, ranges in Melbourne from 3s. to 10s. per week. In the country the rate is somewhat lower, and on the goldfields a canvas tent is set up, or a cottage of logs or split timber, with a bark roof, is erected upon Crown lands, so that rent is altogether saved.

240. It may be remarked that there exists a laudable desire amongst all ranks in Victoria, and particularly amongst the labouring population, to possess dwellings of their own. To aid in this object, building societies have been established in most parts of the colony, and have met with a large amount of success. At the end of 1865 there were no less than twenty building societies—viz., eighteen terminating and two permanent—in Melbourne alone.

PUBLIC REVENUE AND EXPENDITURE.

241. The Revenue of Victoria is in round numbers £3,000,000 sterling per annum, and the expenditure is about equal. Taking the latest year for which the returns are finally perfected in the Treasury (1864), there appears a net revenue and a net expenditure of slightly under £3,000,000, as will be seen by the following figures :—

TABLE LVI.—REVENUE AND EXPENDITURE, 1864.

	£	s.	d.
Balance from 1863	£106,023	1	2
Net revenue	2,955,338	7	0
	£3,061,361	8	2
Net expenditure	2,928,903	7	1
Balance	£132,458	1	1

242. The revenue and expenditure for 1865 will not be known accurately until the end of 1866, as receipts and payments on account of 1865 will be made until that period. But from what has been already received and expended, and what is still expected, the Under Treasurer has been able to make the following estimate :—

TABLE LVII.—PROBABLE REVENUE AND EXPENDITURE, 1865.

	£	s.	d.
Balance from 1864	£132,458	1	1
Probable net revenue	3,060,000	0	0
	£3,192,458	1	1
Probable net expenditure	2,960,000	0	0
Probable balance	£232,458	1	1

243. Taking the mean population of Victoria in 1865 as 616,375, and comparing it with these estimates, it will follow that the probable revenue for that year would be in the proportion of £4 19s. 3½d., and the probable expenditure in the proportion of £4 16s. 0½d. to each inhabitant of the colony. Going through a similar calculation for each year from that of the separation of the colony from New South Wales to the end of 1864, the following are the actual results, by which it will be seen that the greatest total revenue raised was in 1857, and the greatest total expenditure was in 1854; also, that the largest revenue and expenditure per head of the population was in 1853, in which year the amounts raised and expended per head were respectively more than three times as great

as they have been in the last three years, and nearly three times as great as they were in the three previous ones.

TABLE LVIII.—POPULATION, REVENUE, EXPENDITURE, 1851-1864.

YEAR.	ESTIMATED MEAN POPULATION.	NET REVENUE.		NET EXPENDITURE.	
		Total Amount.	Rate per head of the Population.	Total Amount.	Rate per head of the Population.
		£	£ s. d.	£	£ s. d.
1851	86,825	392,455	4 10 5	410,864	4 14 8
1852	132,905	1,634,448	12 5 11	978,922	7 7 4
1853	195,378	3,235,546	16 11 2	3,216,609	16 9 3
1854	267,371	3,087,986	11 11 0	4,185,708	15 13 1
1855	338,315	2,728,656	8 1 4	2,612,807	7 14 6
1856	380,942	2,972,496	7 16 1	2,668,834	7 0 1
1857	430,347	3,328,303	7 14 8	2,968,658	6 17 11
1858	483,827	2,973,383	6 2 11	3,092,720	6 7 10
1859	517,226	3,261,104	6 6 1	3,395,946	6 11 3
1860	539,337	3,082,461	5 14 4	3,315,307	6 2 11
1861	541,012	2,952,101	5 9 1	3,092,021	5 14 4
1862	548,450	3,269,079	5 19 2	3,039,497	5 10 10
1863	561,322	2,774,686	4 18 10	2,882,937	5 2 8
1864	589,160	2,955,338	5 0 4	2,928,903	4 19 5

244. The figures of revenue referred to are exclusive of loans; those of expenditure include the cost of collection throughout, and the repayment of loans in the following years, viz.:—

Year.	£	Year.	£	Year.	£
1856............	150,000	1859................	50,000	1862................	50,000
1857.............	30,000	1860................	50,000	1863................	50,000
1858	37,000	1861................	50,000	1864................	50,000

ORDINARY AND EXTRAORDINARY EXPENDITURE.

245. The rates of revenue and expenditure per head of the population, as shown in the last table, appear large when contrasted with the amounts raised and expended in older countries, but it must not be forgotten that in order to compare the two it is necessary to distinguish between ordinary and extraordinary expenditure. This distinction was fully pointed out by a commission appointed in 1859 to inquire into the state of the Civil Service of Victoria.

246. The following is an extract from the report of the Commissioners:—

It is a necessary incident of the imperfect stage of political development that pertains to a very young country, that the Government is obliged to undertake many functions from which at a more advanced period of the country's growth it is relieved. In addition to the ordinary duties of government, the Government of this country is compelled to conduct the business of a great landowner—to survey, to lease, and to sell its property, its town lots, its country lands, its pastures, and its mines; to construct and maintain roads and bridges, and other works of public utility; to form railways and electric telegraphs; to assist municipalities, road boards, mining boards, and charitable institutions; to establish and supervise light-houses, lunatic asylums, pounds, and cemeteries, and to do many other acts which in older countries possessing similar institutions are effected either through private enterprise or through local exertion. Such undertakings may be, indeed, in our present circumstances, unavoidable, but they form the principal part of the public expenditure, and their cost, like that of every extraordinary business conducted by Government, is necessarily greater than it will be when the progress of the country admits of these functions being discharged by more suitable organs.

247. The Commissioners then went on to analyse the authorised expenditure for the year 1859, and the conclusion they arrived at was that the

expenditure proposed, viz., £3,583,598, consisted of ordinary expenditure (or that which in all countries it is considered the function of governments to undertake) amounting to £1,188,801, and of extraordinary expenditure (or that from which older States are to a great extent exempted) amounting to £2,394,797, the latter being in round numbers twice as much as the former.

248. Following out the calculations of the Commissioners for the present year (1866), it is found that the sums voted and the special appropriations amount in the gross to £3,490,673; and that of this total, £1,141,833* may fairly be classed as ordinary or indispensable expenditure, and £2,348,840 as extraordinary or special expenditure; the former being at the rate of £1 16s. 0¾d. per head of the population, as estimated on the 30th June, and the latter at the rate of £3 14s. 2½d. per head. Thus, while the whole amount authorised would, if expended, be equal to £5 10s. 3¼d. per head, the ordinary expenditure of the country would barely equal a third of that sum.

PUBLIC DEBT.

249. At the end of 1865 the public debt of the colony of Victoria amounted to £8,733,445. This sum consisted of the aggregate of the following amounts:—

TABLE LIX.—PUBLIC DEBT, 1865.

AMOUNT.	Rate of Interest per Annum.	Act under which the Loan was Legalised.	PARTICULARS.
£	Per cent.		
393,000	6	18 Vict., No. 40	The residue of a loan of £800,000, for which debentures were issued in 1855, 1857, and 1858, to obtain funds for the construction of waterworks to supply the city of Melbourne and town of Geelong with water. This loan is being paid off by annual instalments of about £50,000 each, and the whole is extinguishable in 1873.
67,800	5	19 Vict., No. 15	The residue of a loan of £68,100, for which debentures were issued during 1856, to obtain funds for the purchase of the privileges, rights, and property of the Melbourne, Mount Alexander, and Murray River Railway. Only £300 has been repaid of this loan.
7,936,945	6	21 Vict., No. 36	As much as has been required to be raised of a loan limited to £8,000,000, for which debentures have been issued to the extent named, from 1858 to 1865, to obtain funds for the construction of railways.
175,700	6	25 Vict., No. 130	As much as has been required to be raised of a loan limited to £300,000, for which debentures to the extent named were issued in 1865, to obtain funds to repair the Melbourne and Geelong Railway, to form branch lines, and for other purposes in connection with the said railway.
60,000	...	...	Amount of advance from the London Chartered Bank, viz., £50,000 on account of railways and £10,000 on account of water supply. This advance has been obtained in anticipation of a loan, limited to £850,000,† authorised by Act 29 Vict., No. 287, to be raised by the issue of debentures, bearing interest at the rate of 6 per cent. per annum, for the following purposes:—Railways, £250,000; defences, £100,000; water supply, £500,000. Total, £850,000.
8,783,445			

* In this sum the military and defences of the colony, amounting to a total of £57,000, are included.

† According to advices just received by the mail, which left England on the 26th October, 1866, this loan has been successfully placed upon the London money market, tenders for not less than £3,000,000 having been sent in.

250. The whole of these loans, both as regards principal and interest, are made a primary charge upon the revenues of the colony by the Acts in pursuance of which their contraction was authorised.

251. The state of the public debt of Victoria, at the end of each of the last ten years, was as follows :—

Table LX.—Public Debt, 1856-1865.

Year.	Amount Due on the 31st December of each Year.					
	Loan to Supply Water to the Towns of Melbourne and Geelong.	Loan to Purchase the Rights of the Melbourne, Mount Alexander, and Murray River Railway Company.	Loan to Construct Railways.	Loan to Repair Melbourne and Geelong Railway, &c.	Bank Advances.	Total.
	£	£	£	£	£	£
1856	580,000	68,100	...	...	...	648,100
1857	760,600	68,100	...	...	...	828,700
1858	740,000	68,100	...	...	...	808,100
1859	695,000	68,100	1,326,400	...	...	2,089,500
1860	650,000	68,100	4,400,000	...	...	5,118,100
1861	600,000	68,100	5,676,960	...	...	6,345,060
1862	548,900	68,100	7,380,740	...	...	7,992,740
1863	491,800	67,800	7,677,920	...	...	8,237,520
1864	443,000	67,800	7,933,170	...	...	8,443,970
1865	393,000	67,800	7,936,945	175,700	60,000	8,733,445

252. Besides these amounts, regularly borrowed by the Government, loans for improvements of the city of Melbourne and town of Geelong, with the principal guaranteed out of the revenues of the colony, were sanctioned by the following Acts :—For Melbourne, 17th Vict., No. 13, and 18th Vict., No. 21; and for Geelong, 17th Victoria, No. 23, and 18th Victoria, No. 22. These were obtained by the issue, at five per cent. discount, of debentures bearing interest at the rate of 6 per cent. per annum, which was made a first charge upon the revenues of the two corporations. These loans were raised in 1854-5, and were originally of the following amounts :—

Melbourne	£525,000
Geelong	210,000

253. The Melbourne loan is now in the course of being paid off by annual instalments of £25,000, and the Geelong loan by annual instalments of £10,000. At this rate both will be extinguished in the year 1875.

LOCAL GOVERNMENT.

254. There are two modes of local self-government existing in Victoria, both of which are legalised and regulated by Acts of Parliament—the one by municipalities or boroughs, the other by shires or road districts.

255. The boroughs must not be of greater area than nine square miles in extent, and must each have a population of at least 300. They are governed by a council, consisting of nine members, who elect one of their number annually as mayor. This council have power to levy rates, make by-laws, compulsorily take land for permanent public works, &c. A third of their number retires by rotation annually.

256. The council are elected by the ratepayers, who are styled "burgesses," and are allowed to vote upon the following scale :—

Those having property of a rateable value of less than £100—one vote.

Those having property of a rateable value of £100, and less than £150 —two votes.

Those having property of a rateable value of £150 and upwards—three votes.

257. Rates are allowed to be levied upon all lands within a borough except Crown property, mines, and reserves for charitable, ecclesiastical, or educational purposes. No rate is allowed to be less than 6d. or more than 2s. in the pound upon the net annual value of the rateable property.

258. The mayor of a borough is, for the time being, a justice of the peace for the colony by virtue of his office; but he is only allowed to act as such in courts of justice held within the borough to which he belongs.

259. The following table shows the number of municipalities formed, the estimated total and annual value of rateable property therein, and their total revenue and expenditure during each of the last nine years. Particulars respecting the corporate towns of Melbourne and Geelong are included in the table, although they are not under the Municipal Institutions Act (27 Vict., 184), but were incorporated by special Acts before the present system of municipal government was instituted :—

TABLE LXI.—MUNICIPALITIES, 1857-1865.

Year.	Number of Corporate Towns and Municipalities Formed.	Estimated Value of Rateable Property. Total.	Estimated Value of Rateable Property. Annual.			Revenue.			Expenditure.		
		£	£	s.	d.	£	s.	d.	£	s.	d.
1857...	19	2,557,794	...			219,960	5	8	296,176	14	4
1858...	29	2,605,546	...			314,316	3	6	290,358	19	11
1859...	37	3,384,737	...			318,623	11	7	353,869	11	2
1860...	41	18,715,561	2,309,187	9	11	324,728	3	8	336,629	5	6
1861...	48	20,690,476	2,171,766	15	1	284,177	15	7	287,819	15	9
1862...	53	18,377,042	2,193,388	13	0	262,179	4	8	290,110	14	8
1863...	58	17,750,027	2,119,119	18	3	257,641	18	8	262,169	15	9
1864...	61	17,495,183	2,071,259	10	7	336,665	11	11	316,113	1	6
1865...	62	20,476,266	2,379,829	5	0	308,619	10	3	369,968	5	4

ROAD DISTRICTS.

260. Road districts must embrace at least 40 square miles, and must contain rateable property whereof the net annual value is not less than £5000.

261. District boards consist of six members, one-third of whom retire annually. They are presided over by a chairman, who is elected by themselves out of their number, and who retains his office for one year. In electing the councillors, owners or occupiers of rateable property of an annual value of £150 and upwards are entitled to three votes; from £100 to £150 annual value, to two votes; and from £10 to £100 annual value, to one vote.

262. District rates must not be less than 6d. nor more than 2s. in the pound. They may be levied upon all land within the district, with the same exceptions as regards mines, public property, &c., as in municipalities. They are levied upon the full net annual value of all property, except Crown lands leased for pastoral purposes only, upon which they are only to be levied on the third part of the net annual value.

263. District boards are entitled to make by-laws for the due management of their respective districts, and to expend the district revenues in constructing and keeping in repair roads and bridges within its boundaries.

SHIRES.

264. Road districts containing an area of not less than 100 square miles may be proclaimed as shires, provided that their actual revenue from rates amounts to not less than £1000 annually. This gives them additional privileges to those enjoyed by road districts. The district board becomes the shire council; the chairman receives the title of president, and is by virtue of his office a justice of the peace for the time being. They are allowed to contract loans upon the security of special rates, and have jurisdiction over pounds, commons, slaughter-houses, &c.

265. The following table shows the number of shires and road districts formed, the estimated total and annual value of rateable property therein, and their revenue and expenditure during each of the last nine years.

TABLE LXII.—ROAD DISTRICTS AND SHIRES, 1857-1865.

Year.	Number of Road Districts and Shires Formed.*	Estimated Value of Rateable Property. Total.	Estimated Value of Rateable Property. Annual.	Revenue.	Expenditure.
		£	£ s. d.	£ s. d.	£ s. d.
1857...	16	641,112	...	58,113 0 11	53,482 0 9
1858...	[illegible]	2,663,398	...	98,780 2 7	91,300 5 3
1859...	30	8,107,226	582,559 14 11	118,620 8 7	115,256 18 1
1860...	42	5,409,687	494,029 8 6	122,469 18 1	125,852 5 11
1861...	60	9,916,311	1,028,759 14 11	146,128 14 2	131,091 10 9
1862...	[illegible]	4,231,308†	562,496 5 9†	226,833 5 3	198,647 17 [illegible]
1863...	93	12,437,403	1,479,681 4 9	200,521 11 3	212,042 10 6
1864...	99	13,500,916	1,827,386 15 0	349,339 12 5	345,669 9 11
1865...	98	16,364,788	2,195,820 18 10	370,810 15 8	416,949 8 7

266. Boroughs as well as shires and road districts have hitherto received an annual grant from Parliament in aid of their revenues, but by the Municipal Institutions Act (27 Vic., No. 184) and the Local Government Act (27 Vic., No. 176), both passed in 1863, provision is made for their endowment upon a system whereby these annual grants will gradually cease.

267. The area, number of dwellings, and population contained in municipalities and road districts at the end of 1865, according to the estimates of the local authorities, were as follow:—

TABLE LXIII.—BOROUGHS AND ROAD DISTRICTS, 1865.

	Estimated Area in Acres.	Estimated Number of Dwellings.	Estimated Population.
Boroughs....................................	241,865	69,654	306,112
Road Districts and Shires.............	38,617,858	54,667	253,209
Total..............................	38,859,723	124,321	559,321

* Prior to 1863 all were road districts. In 1863 eight, in 1864 thirty-four, and in 1865 forty-five of the number were shires.

† The total and annual value for the year 1862 does not apply, as in other years, to all the rateable property in the district, but only to messuages, tenements, and dwelling-houses.

268. The area of the colony being 55,571,840 acres, the number of dwellings 150,000, and the total population 626,639, it would appear from these estimates that upwards of two-thirds of the colony, and more than four-fifths of the houses it contains, are situated within the limits of boroughs and road districts, whilst fully eight-ninths of the population are enjoying the advantages of self-government.

ACCUMULATION.

BANKS.

269. There are nine banks of issue in Victoria. Of these, three are local institutions, viz., the Bank of Victoria, the Colonial Bank of Australasia, and the National Bank of Australasia. The remaining six have proprietaries outside the colony, viz., the Bank of Australasia, the Union Bank of Australia, the English, Scottish, and Australian Chartered Bank, the Oriental Bank, the London Chartered Bank, and the Bank of New South Wales.

270. These banks are regulated under the Banks and Currency Statute (27 Vict., No. 194). By the provisions of this Act, each bank is compelled, under heavy penalties, to prepare and keep weekly statements, exhibiting its assets, property, credits, and securities, as well as its debts, engagements, and liabilities, and from these statements to compile quarterly a general statement setting forth its average assets and liabilities, capital, and profits, which is sworn to by the manager and published in the *Government Gazette*. By this means the public is made acquainted with the exact financial position of each bank four times in the course of the year. The Act further requires a copy of the charter of each bank, and a sworn list of the names and addresses of its proprietors, to be recorded in the office of the Registrar-General, these documents to be open for inspection at all reasonable times upon the payment of a small fee.

271. The number of branches or agencies of these nine banks within the colony during 1865 was 151, including the head offices. The following were the average rates per cent. per annum of discount upon local bills during the same year:—

Under 65 days' currency	7 per cent. to 8 per cent.
,, 95 ,, ,,	8 ,, ,, 9 ,,
95 to 125 ,, ,,	9 ,, ,, 10 ,,
Above 125 ,, ,,	10 ,, —

272. The following were the average rates of exchange during the year for bills drawn upon places without the colony:—

London	Par to 1 per cent. premium.
British India	2s. 1d. per rupee.
New South Wales	¼ per cent. premium.
Queensland	1 per cent. premium.
South Australia	½ per cent. to 1 per cent. premium.
Tasmania	¾ ,, ,, 1 ,, ,,
New Zealand	¾ ,, ,, 1 ,, ,,

273. The following particulars have been gathered from the sworn returns of the nine banks for the last quarter of 1865:—

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ASSETS.

	£	s.	d.
Coined gold and silver and other coined metals	£1,356,540	0	5
Gold and silver in bullion or bars	454,134	17	2
Landed property	517,904	1	8
Notes and bills of other banks	175,323	6	0
Balances due from other banks	167,728	5	10
Government securities	123,705	17	3
All debts due to the banks*	11,960,181	15	4
Total	£14,755,518	3	8

LIABILITIES.

	£	s.	d.
Notes in circulation not bearing interest	£1,319,186	15	9
Bills in circulation	75,791	5	8
Balances due to other banks	137,690	3	2
Deposits not bearing interest	3,234,694	17	6
,, bearing interest	5,180,700	11	0
Total	£9,948,063	13	1

274. The sworn returns further show that the aggregate amount of paid-up capital of the nine banks at the end of 1865 was £8,007,500; that the average rate of the last dividend declared was $11\frac{9}{10}$ per cent., ranging from 20 per cent. by the Bank of New South Wales, 18 per cent. by the Union Bank, and 14 per cent. by the Bank of Australasia, to 7 per cent. by the English, Scottish, and Australian, and 8 per cent. by the London Chartered Bank, whilst the three local banks declared 10 per cent., as also did the Oriental Bank; that the total amount of dividend declared was £505,066; and that the amount of reserved profits at the time of declaring the dividend was £1,963,717 9s. 1d.

275. In addition to these nine banks, there were in 1865 four branches of Indian banks transacting business in Melbourne, viz., the Agra and Masterman's Bank, the Asiatic Banking Corporation, the Central Bank of Western India, and the Royal Bank of India. These branch banks have been established here chiefly for the purpose of buying gold and issuing drafts, but they do not circulate notes nor receive deposits, and consequently do not give in sworn returns under the Banks and Currency Statute.

SAVINGS BANKS.

276. The savings banks in Victoria are under the control of five commissioners, who are a body politic and corporate, capable of suing and being sued. All deposits lodged in savings banks, and securities held by them, are vested in these commissioners.

277. The rate of interest on deposits is fixed and determined by the commissioners, but by the Savings Bank Statute (28 Vict., No. 263) it must not exceed 4 per cent. per annum.

278. On the 30th June, 1865, which was the end of the savings banks' financial year, there were eleven savings banks in the colony, viz., at Melbourne, Geelong, Portland, Belfast, Castlemaine, Sandhurst, Ballarat, Maryborough, Warrnambool, Kyneton, and Hamilton. The number of depositors in these was 17,948, and the amount to their credit was £719,100 15s. 4d. The number of depositors increased by 747 during the financial year, but the amount deposited fell off by £50,580 10s. 8d.

* Including notes, bills of exchange, and all stock and funded debts of every description except notes, bills, and balances due from other banks.

279. The following table shows the number of depositors on the 30th June, 1865, and the amount of their deposits in classified arrangement:—

TABLE LXIV.—SAVINGS BANKS, DEPOSITORS, AND AMOUNTS.

Classification.	Number of Depositors.	Amount of Deposits.
		£ s. d.
Under £20	9,990	59,037 16 6
£20 and under £50	3,846	121,386 9 0
£50 " £100	2,139	148,407 11 10
£100 " £150	890	106,818 13 2
£150 " £200	407	69,596 7 10
£200 and upwards	676	213,858 17 6
Total	17,948	719,100 15 4

280. During the six months intervening between the end of the financial year, and the 31st December, 1865, the number of depositors had fallen off by 751. This decrease was in all probability partly due to the establishment of Post-office Savings Banks during the last quarter of the year. The depositors on the 31st December numbered 17,197; of these, 10,715 were males, and 6,482 were females.

281. The following table gives the number of savings banks, the number of depositors, the amount of their balances, and the average to each depositor, during each of the last ten years:—

TABLE LXV.—SAVINGS BANKS, 1856-1865.

On the 30th June.	Number of Savings Banks.	Number of Depositors.	Amount of Depositors' Balances.	Average Amount to each Depositor.
			£	£ s. d.
1856	6	3,620	245,923	67 18 8
1857	7	5,682	374,868	65 19 6
1858	7	7,232	432,250	59 15 4
1859	7	8,854	468,778	52 18 11
1860	9	10,135	484,500	47 16 1
1861	10	12,001	582,795	48 11 8
1862	10	13,309	634,884	47 14 1
1863	11	14,920	701,425	47 0 8
1864	11	17,201	769,081	44 15 0
1865	11	17,948	719,101	40 1 4

POST-OFFICE SAVINGS BANKS.

282. By the Post-office Statute of 1865 (29 Vict., No. 277), provision was made for the establishment of Post-office Savings Banks, and for allowing interest at a rate not exceeding 4 per cent. per annum upon deposits placed therein. Accordingly on the 11th September, 1865, Post-office Savings Banks were opened at Melbourne, Williamstown, Geelong, Ballarat, Sandhurst, Castlemaine, Maryborough, and Beechworth, and between that date and the close of the year, at 23 other towns. The whole number of places whereat these institutions had been established up to the 31st December, 1865, was thus 31. In these the number of persons who opened accounts from the date of their establishment to the close of the year was as follows:—

Males	1490
Females	737
Total	2227

283. The number of depositors who closed their accounts during 1865 was 101, so that the number at the end of the year was 1126.

284. The total number of deposits made during the year was 4964, amounting in the aggregate to £18,526 7s. 3d. The number of withdrawals was 495, amounting to £3058 7s. 9d. Thus the sum of the balances in Post-office Savings Banks at the end of the year amounted to £15,467 19s. 6d.

DEPOSIT BANKS.

285. In addition to the two descriptions of Government Savings Banks which are in existence, there are also in operation several private institutions for the deposit of savings. At these establishments, rates of interest varying from 5 to 10 per cent. per annum are given. Since the failure of one of these deposit banks, the Provident Institute, which took place in 1862, the same amount of confidence has not been felt in them as formerly, but they are, notwithstanding, largely patronised by persons who prefer the prospect of a high rate of interest to the perfect security offered by the regular savings banks.

286. The principal of these institutions are the Melbourne Banking Corporation, the Land Mortgage Bank, and the Victoria Savings Institute. All of these have influential proprietaries, and appear to be in a prosperous condition. Several of the most successful building societies also receive deposits for fixed periods, and the security offered by them is probably quite equal to that held out by the deposit banks.

FRIENDLY SOCIETIES.

287. Numerous friendly societies are established in Victoria, for the purpose of providing medical attendance and aliment for sick members, and funeral expenses at death.

288. The following is a statement of the affairs of the friendly societies who furnished returns to the Registrar-General for the year 1865:—

TABLE LXVI.—FRIENDLY SOCIETIES, 1865.

Name of Friendly Society.	No. of Lodges or Courts.	No. of Members at end of Year.	Revenue.			Expenditure.			Assets.			Liabilities.		
			£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Independent Order of Odd Fellows, Manchester Unity	106	10,012	38,974	6	10	29,160	14	7½	73,165	12	6	342	6	3½
Ancient Independent Order of Odd Fellows	22	1,339	4,104	11	8	2,758	3	11½	3,012	14	6½	236	5	6
Grand United Order of Odd Fellows	28	1,523	4,359	[illegible]	9	3,597	6	6	4,189	16	8	—		
Ancient Order of Foresters	96	9,268	27,396	15	10	21,325	14	7½	25,228	8	0½	508	9	8
Ancient Order of Druids	3	74	212	5	0½	193	3	2	222	18	4	—		
Ancient Order of Royal Foresters	2	65	182	5	3	144	7	9	93	14	1	—		
Ancient Order of Shepherds	6	168	235	0	9	157	11	7½	314	5	[illegible]	6	18	0
Independent Order of Rechabites	43	1,458	2,930	9	4½	959	1	1	2,727	18	4½	—		
St. Patrick's Society	4	338	3,238	6	4	1,440	4	11	6,992	6	11	32	7	6
St. Francis' Benefit Society	1	27	67	10	1	47	17	[illegible]	42	18	5	—		
United Brethren Friendly Society	1	9	16	4	[illegible]	0	6	0	45	3	1	—		
Sons of Temperance	1	90	270	10	10	110	7	0	400	8	7	5	0	0
Agricultural and Tradesmen's Benefit Society	1	89	45	10	9	14	4	7	81	6	9	—		
Total	313	24,410	81,083	6	7	60,414	2	10	116,417	11	7	1,131	6	11½

289. The total number of non-fatal cases of sickness experienced during the year by these societies was 3221, and the number of deaths

was 167. The time for which aliment was allowed was 14,972 weeks and 5 days. The period of sickness before death was 1186 weeks.

290. It may be remarked that all the friendly societies in Victoria are not represented in this return, but only such as furnished statements in accordance with the Friendly Societies Statute (28 Vict., No. 254). This Act does not provide any penalties for not sending in returns, and therefore many of the societies fail to supply them.

MORTGAGES AND LIENS.

291. In the year 1865 there were 1901 mortgages effected upon land, securing a total amount of £1,334,316 17s. 2d.; also, 1178 mortgages on land paid off, and releases granted of a total amount of £547,031 9s. 8d. During the same period, 262 mortgages on live stock were effected, by means of which sums amounting to £1,170,681 19s. 5d. were secured upon 1,631,288 sheep, 43,080 cattle, 1675 horses, and 568 pigs ; releases were granted of 100 mortgages on live stock, the amount paid off being £646,195 14s. 7d.; and the stock released, 1,013,460 sheep, 37,719 head of cattle, and 881 horses. There were also 189 preferable liens on wool registered, securing £655,562 5s. 5d. upon 2,553,724 fleeces, and four paid off, releasing £18,110 2s. 2d. secured upon 36,900 fleeces.

292. The classification of the various transactions according to the sums advanced is as follows :—

TABLE LXVII.—MORTGAGES, LIENS, AND RELEASES, 1865.

Consideration.	Land.		Live Stock.		Wool.	
	Number of Mortgages.	Number of Releases.	Number of Mortgages.	Number of Releases.	Number of Liens.	Number of Releases.
Under £100	370	201	18	—	6	1
£100 to £250	719	369	32	1	15	—
£250 to £500	355	179	29	1	11	1
£500 to £1000	204	107	31	8	25	—
£1000 to £5000	174	112	70	41	95	—
£5000 and upwards	45	17	70	46	37	2
Unspecified	34	193	12	3	—	—
Total	1901	1178	262	100	189	4

293. The following table gives the number of transactions and the amount secured on land, live stock, and wool, during each of the last ten years :—

TABLE LXVIII.—MORTGAGES AND LIENS, 1856-1865.

Year.	Land.				Live Stock.				Wool.				Total.			
	Number of Mortgs	Amount Secured.			Number of Mortgs	Amount Secured.			Number of Liens	Amount Secured.			Number of Transactions.	Amount Secured.		
		£	s.	d.		£	s.	d.		£	s.	d.		£	s.	d.
1856	1570	1,145,092	13	0	154	870,420	1	1	50	110,122	15	0	1774	2,125,635	9	1
1857	2081	1,633,980	15	7	140	679,010	10	6	51	105,445	3	11	2272	2,418,436	10	0
1858	2990	1,794,758	3	4	171	893,735	4	0	60	86,758	11	7	3221	2,775,251	18	11
1859	3137	2,093,609	12	11	182	1,002,297	1	5	87	194,273	18	1	3406	3,290,180	12	5
1860	3125	2,348,822	19	8	262	1,101,751	17	8	137	291,780	6	6	3524	3,742,355	3	10
1861	2592	1,405,461	7	5	239	902,099	15	9	163	437,117	5	5	2994	2,744,678	8	7
1862	2097	1,454,717	16	7	253	1,142,584	16	5	196	577,020	3	11	2546	3,174,322	16	11
1863	2136	1,665,330	17	4	272	1,215,907	9	9	186	495,622	13	3	2594	3,376,861	0	4
1864	1969	986,749	13	9	234	1,094,317	3	4	201	567,607	2	2	2404	2,648,673	19	3
1865	1901	1,334,316	17	2	262	1,170,681	19	5	189	655,562	5	5	2352	3,160,561	2	0

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RELIGIOUS, MORAL, AND INTELLECTUAL PROGRESS.

CLERGY, CHURCHES, SUNDAY SCHOOLS, ETC.

294. The clergy of all denominations throughout Victoria registered for the celebration of marriages, numbered 470 at the end of the year 1865.

295. The total number of buildings used for public worship in Victoria up to the end of 1865 was 1695. Of these 879 were churches and chapels, 349 were school-houses, and 467 were dwellings or public buildings. The approximate number of services performed during the year was 138,991, the number of persons for whom accommodation was provided was 234,204, and the numbers usually attending at the principal service on the Sabbath was 142,442.

296. The number of Sunday-schools connected with all the denominations at the end of 1865 was 980. The number of instructors in these was 8078, of whom 4235 were males and 3843 were females. The average number of scholars attending was 63,908, of whom 31,177 were males and 32,731 were females.

297. The present number of adherents to the different denominations cannot be ascertained, in the absence of a recent census, but the following table gives returns of the clergy, churches, and Sunday-schools belonging to each religious body, brought down to the end of 1865 :—

TABLE LXIX.—CLERGY, CHURCHES, SUNDAY-SCHOOLS, &c., 1865.

Religious Denomination.	No. of Registered Clergy.	Edifices used for Public Worship.		Sunday Schools.	
		No.	Persons for whom there is Accommodation.	No.	Scholars usually attending.
Church of England	113	316	43,479	191	11,895
Free Church of England	1	1	400	1	75
Roman Catholic	51	285	41,095	122	8,682
Presbyterian	105	372	32,202	189	8,715
Free Presbyterian	6	15	2,290	11	318
United Presbyterian	7	8	2,400	9	526
Reformed Presbyterian	1	6	690	1	30
Wesleyan Methodist	55	319	59,206	245	19,427
Independent Wesleyan	1	3	500	1	85
Primitive Methodist	16	112	12,170	65	3,355
United Methodist Free Church	6	16	2,140	14	829
Methodist New Connection	1	1	700	...	...
Bible Christians	11	38	3,776	22	946
Independent or Congregational	40	62	11,745	43	4,733
Baptist	32	70	10,350	37	3,032
Welsh Baptist	...	1	124	1	45
Evangelical Lutheran	6	20	3,000	5	250
Unitarian	1	1	200	1	18
Welsh Calvinistic Connection	1	8	1,210	8	305
Welsh Congregation	...	1	100	1	53
Christians or Disciples of Christ	2	18	2,337	8	377
Society of Friends	1	1	150	...	...
Victoria Free Church	1	1	300	1	150
United Brethren or Moravians	2	4	250	2	32
Catholic and Apostolic Church	1	4	...	...	...
Mariners' Church	1	1	200	1	30
Christian Israelites	1	4	840	...	...
Reformed Christian Church	2	2	200	...	...
Jews	5	5	2,150	...	...
Total	470	1,695	234,204	980	63,908

298. The population of Victoria at the end of 1865 was 626,639. There was thus one clergyman to every 1333 of the population, and one building used for religious worship to every 370. The religious edifices contained accommodation for 37 per cent. of the population. There was one Sunday-school to every 639 persons, and the Sunday scholars amounted to about one in every ten of the inhabitants of the colony. The number of clergymen appears small as compared with the number of churches and chapels, but it must be understood that in many of the country districts there is not a service every Sunday, and sometimes not oftener than once a month; also, that there are officials connected with many of the denominations who, without being regularly ordained, perform most of the functions of clergymen, such as lay readers, local preachers, &c. These are not included in the figures given in the table.

MELBOURNE PUBLIC LIBRARY.

299. The Melbourne Public Library was opened on the 11th February, 1856, at which time only a small portion of the building was completed. Important additions have been made to it since, but it is still unfinished. The total cost of the building to the end of 1865 was nearly £50,000 (£48,405 6s. 7d.). In addition to this, sums amounting in the aggregate to £75,558 14s. 11d. have been expended upon the purchase of books, salaries, &c., making a total of £123,964 1s. 6d. The whole of this amount has been provided by the State.

300. The expenditure in 1865 upon building, maintenance, and the purchase of books was £8111 19s. 9d.

301. The number of volumes in the Library is 38,417, of which 5932 were presented and the remainder purchased out of the amounts voted. Her Majesty Queen Victoria, the Emperor of the French, and other European potentates are amongst the donors of books. The Library, which is open on all working days from 10 a.m. to 10 p.m., was visited during 1865 by 207,754 persons. No charge is made for admission.

MUSEUM OF ART AND PICTURE GALLERY.

302. Attached to the Library and in the same building is a Museum of Art and a Picture Gallery. Both of these are open to the public without charge. The former was visited in 1865 by 43,048 persons, and the latter by 35,205 persons.

MECHANICS' INSTITUTES, ETC.

303. There are Mechanics' Institutes, Free Libraries, or other institutions of a similar character in most of the principal towns. Some of these receive books on loan from the Melbourne Public Library. Thirty-four of these institutions furnished returns to the Registrar-General in 1865. Their statements show that the sums received by them from Government up to the end of that year amounted to £11,354 4s. 3d., and the private contributions to £46,922 16s. 1d., and that of these amounts £31,342 5s. 6d. had been spent on building; that the number of volumes in all the institutions amounted to 53,172, of which 8494 were presented by private individuals; and that the total number of visitors during the year was 227,711.

NATIONAL MUSEUM.

304. The collections of the National Museum are kept in a building attached to the Melbourne University. This edifice was erected at a cost of £8500. It is open to the public free of charge on all week days throughout the year except Christmas Day and Good Friday, and in 1865 was visited by nearly 80,000 persons. During the same year purchases were made to the extent of £2500; and the cost of maintenance, including salaries and wages, was £1365. This Museum is under the direction of one of the University Professors (Professor M'Coy), who receives a special salary for performing this duty.

CHARITABLE INSTITUTIONS.

305. The charitable institutions in Victoria are numerous and various. Many of them are subsidised by the State, and they are also largely contributed to by private individuals.

306. There are 24 General Hospitals in existence, situated at the following places:—Amherst, Ararat, Ballarat, Beechworth, Belfast, Bendigo, Castlemaine, Creswick, Daylesford, Dunolly, Geelong, Hamilton, Heathcote, Inglewood, Kilmore, Kyneton, Maldon, Maryborough, Melbourne, Pleasant Creek, Portland, Swan Hill, Warrnambool, and Wood's Point. Besides these, there is a Lying-in Hospital situated in the metropolis.

307. There are also five Benevolent Asylums, where aged and infirm persons are received as inmates, and out-door relief is given to the necessitous. These are situated at Ballarat, Beechworth, Bendigo, Castlemaine, and Melbourne.

308. There is an institution in Melbourne partaking of the nature of a benevolent asylum, called the Immigrants' Home. It was founded in the first instance for the purpose of affording relief and accommodation to new arrivals, as its name implies, but it now assists all who are in want, without reference to the period of their residence in the colony.

309. There is a Protestant and a Roman Catholic Orphan Asylum in Melbourne, also Orphan Asylums connected with each of those sects in Geelong.

310. There is a Government Lunatic Asylum, a Deaf and Dumb Institution, a Refuge, a Magdalen Asylum, a Ladies' Benevolent Society, and a Jewish Philanthropic Society in Melbourne. There is also a Ladies' Benevolent Society in Geelong.

311. The Hospitals, including the Melbourne Lying-in Hospital, at the end of 1865 had 156 wards, containing 1,347,650 cubic feet, and made up beds for 983 males, and 428 females, or in all for 1411 patients. The number of persons who received in-door relief during the year numbered 9939, viz., 7119 males, and 2820 females. During the same period 37,340 persons of both sexes received out-door relief.

312. The Benevolent Asylums, including the Immigrants' Home, contained, at the end of 1865, 91 wards, with an aggregate space of 533,067 cubic feet. The beds numbered 994, of which 669 were for males and 325 for females. 6220 persons, viz., 5291 males and 929 females, passed through these institutions during the year, and 40,996 persons were relieved out of doors.

313. The wards in the Orphan Asylums numbered 34, containing 260,269 cubic feet of space. In these 715 beds were made up, viz., 363

for males, and 352 for females. The number of orphans who passed through the asylums during 1865 was 820, viz., 450 boys and 370 girls. Four orphans, viz., 1 male and 3 females, received out-door relief.

314. The Lunatic Asylum, including the branch establishment in the Royal Park, contained 44 wards, being 558,701 cubic feet. The institution had accommodation for 660 males and for 393 females, or for 1053 of both sexes. The patients treated in the Asylum in 1865 numbered 1544, viz., 1014 males and 530 females. The number remaining at the end of the year was 1052, of whom 159 were supposed to be curable, and 893 to be incurable.

315. There were 24 male and 19 female inmates in the Deaf and Dumb Institution during 1865, and 38 remaining there at the end of the year. Of the whole number who passed through, 19 were deaf and dumb from birth, and the remainder became so at ages varying from infancy up to five years.

316. The Refuge contained 27 rooms, with an aggregate space of 12,420 feet, and made up 27 beds. Fifty-nine females passed through the institution during the year. The Magdalen Asylum had four wards, with 16,490 cubic feet of space. It made up 45 beds, and 74 females passed through it.

317. The Melbourne Ladies' Benevolent Society relieved during the year 1043 families, the Geelong Ladies' Benevolent Association relieved 195 families, and the Jewish Philanthropic Society relieved 177 individuals.

318. The receipts and expenditure of the various charitable institutions during 1865 will be found in the following table:—

TABLE LXX.—CHARITABLE INSTITUTIONS, RECEIPTS AND EXPENDITURE, 1865.

Name of Institution.	Receipts.									Expenditure.		
	From Government.			From Private Sources.			Total.					
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
General Hospitals ...	42,885	14	0	23,838	11	10	66,724	5	10	69,044	7	10
Lying-in Hospital ...	1,000	0	0	914	9	6	1,914	9	6	2,516	16	7
Benevolent Asylums	15,365	9	4	12,888	2	7	28,253	11	11	27,738	14	5
Immigrants' Home...	2,000	0	0	2,134	7	4	4,134	7	4	5,307	4	11
Orphan Asylums... ..	9,114	0	6	5,558	19	8	14,668	0	2	16,367	1	4
Lunatic Asylum	46,461	6	8	*			46,461	6	8	42,367	2	11
Deaf and Dumb Inst.	666	13	4	476	12	10	1,143	6	2	1,254	4	6
Refuge	300	0	0	474	6	6	774	6	6	830	19	8
Magdalen Asylum ...	400	0	0	3,811	0	0	4,211	0	0	3,867	10	2
Benevolent Societies	1,845	0	0	2,419	7	9	4,264	7	9	5,379	16	9½
Total	120,038	3	10	52,510	18	0	172,549	1	10	174,673	19	1½

319. It is thus seen that the expenditure of charitable institutions in 1865 slightly exceeded the revenue; also, that about 30 per cent. of the funds raised were from private sources, the remainder being voted by Parliament.

* No account has been furnished of the moneys received by the Lunatic Asylum from private sources.

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EDUCATION.

320. The returns of education, as gathered from the last census, give the numbers and ages of those persons who had acquired the rudimentary arts of reading and writing, but do not supply any particulars of the higher branches of knowledge which many such persons also possessed. The following is a brief summary of the result of this inquiry as regards the population, exclusive of Chinese and aborigines, and of all persons under five years of age :—

TABLE LXXI.—EDUCATION ON 7TH APRIL, 1861.

OF 5 YEARS OLD AND UPWARDS.	PERSONS.	MALES.	FEMALES.
Able to Read and Write	324,125	206,570	117,555
Able to Read only	53,314	24,254	29,060
Unable to Read	38,719	20,988	17,731
Unspecified	3,374	2,497	877
Total	419,532	254,309	165,223

321. Of the children under five, 87, viz., 52 boys and 35 girls, were stated to be able to read and write; and 3311 of both sexes, or 36 in every 1000, to read and not write; making in all 3398 children under five who could read.

322. Of the whole population, about three-fourths were able to read, and nearly two-thirds to read and write. On the other hand, about a fourth were entirely uninstructed. Of persons above five years of age, as shown in the table, about 1 in 11 were unable to read, and rather more than a fifth were unable to write.

323. The period between 5 years of age and 15 may be called the school age. The number of children returned at that age (exclusive of the unspecified as to education) was 86,651; of these, 42,091, or nearly half, could read and write; 25,411 could only read; and 19,149, or nearly a fifth, were uneducated.

324. Of the three principal Protestant denominations, namely, the Church of England, the Presbyterian, and the Wesleyan, the last named were found to have the largest number of children at the school age possessing the rudiments of instruction; inasmuch as 88 Wesleyan children in 100 could read, against 82 Presbyterian children, and 77 children of members of the Church of England. Fifty-seven Wesleyan children in 100 could write, against only 50 of the Presbyterians, and 47 of the Church of England. Only 12 Wesleyan children in 100 were unable to read, against 18 Presbyterian children, and 23 of the Church of England. The standard of the Independents and Baptists as regards their children's primary instruction was higher even than that of the Wesleyans. No less than 88 children of Independents and 87 of Baptists in 100 could read; 61 in 100 of Independents, and 60 of Baptists, could write. The standard of the Jews was still higher. No fewer than 63 in 100 of their children, at the school age, could read and write, which is a larger proportion than was shown by any other sect. Of Roman Catholic children, only 69 in 100 were able to read, and no more than 41 in 100 were able to write, whilst as many as 31 in 100 were uneducated. This is the least satisfactory result shown by the educational returns of any religious denomination.

325. A result on the whole favourable to Victoria is elicited by a comparison of the returns with those of the adjacent colonies of South Australia and New South Wales. Taking all persons over 5 years of age in Victoria, 779 in every 1000 could read and write, against 694 in South Australia, and against only 639 in New South Wales. At the same age, 205 in every 1000 were unable to read in New South Wales, against 120 in 1000 in South Australia, and against only 93 in 1000 in Victoria. At the school age, the results of South Australia are not greatly different from those of Victoria, although slightly in favour of the latter. In South Australia 760 children in 1000 between the ages of 5 and 15 could read; in Victoria 778 in 1000 could read. In both colonies 486 in 1000 could also write. New South Wales, as regards the amount of education possessed by children at the school age, is behind both the other colonies; only 702 in 1000 could read, and no more than 439 in 1000 could write.

UNIVERSITY.

326. The Melbourne University was established under a special Act (16 Vict., No. 34). This Act was assented to on the 22nd January, 1853. It provides for the appointment of a council, consisting of twenty members (of whom sixteen at least are obliged to be laymen), and for the election by them out of their own body of a Chancellor and Vice-Chancellor; also, for the constitution of a senate, to be presided over by a warden, as soon as the number of graduates to the superior degrees of Master of Arts, Doctor of Medicine, Doctor of Laws, or Doctor of Music, amounts to not less than 100; also, for the endowment of the University by the payment of £9000 annually out of the general revenue. It further provides that no religious test shall be administered to any one to entitle him to be admitted to the privileges and advantages of the University.

327. Royal letters patent, under the sign-manual of Her Majesty Queen Victoria, were issued on the 14th March, 1859, declaring that all degrees already granted, or thereafter to be granted, by the Melbourne University, shall be recognised as academic distinctions and rewards of merit, and shall be entitled to rank, precedence, and consideration in the United Kingdom and in British colonies and possessions throughout the world as fully as if they had been granted by any University in the United Kingdom.

328. The foundation stone of the University was laid on the 3rd July, 1854, and the building was opened on the 3rd October in the following year.

329. The number of students who matriculated in 1865 was 27, making a total of 182 who have matriculated since the University was opened.

330. The students attending lectures in 1865 were as follow:—

TABLE LXXII.—MELBOURNE UNIVERSITY.—NUMBER OF STUDENTS.

Attending Lectures in	Matriculated Students.	Non-Matriculated Students.	Total.
Arts	35	1	36
Law	16	32	[illegible]
Engineering	5	—	5
Medicine	7	5	12
Total	[illegible]	38	101*

* The total number of students in 1865 was 94, of whom 53 were matriculated, and 38 were non-matriculated. This is less than the number attending lectures, as shown in the table, in consequence of some of the matriculated students attending lectures in more than one branch of study.

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331. The number of graduates at the Melbourne University during 1865 was 20, of whom 8 received direct, and 12 *ad eundem*, degrees. The number of graduates during the eleven years the University has been founded are as follows:—

TABLE LXXIII.—MELBOURNE UNIVERSITY.—NUMBER OF GRADUATES.

DEGREES.	DIRECT.	AD EUNDEM.	TOTAL.
Bachelor of Arts...............	28	22	50
Master of Arts	17	19	36
Bachelor of Medicine	8	1	9
Doctor of Medicine	8	32	40
Master of Surgery	—	—	—
Bachelor of Laws	4	2	6
Doctor of Laws	—	2	2
Bachelor of Music	—	—	—
Doctor of Music..............	—	—	—
Total	65	78	143

332. The receipts and expenditure of the Melbourne University during each of the last seven years have been as follows :—

TABLE LXXIV.—MELBOURNE UNIVERSITY.—RECEIPTS AND EXPENDITURE, 1859-1865.

YEAR.	RECEIPTS.												EXPENDITURE.		
	Government Aid.			College Fees.			Other Sources.			Total.					
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1859 ...	9.000	0	0	—			653	12	0	9,653	12	0			
1860 ...	9,000	0	0	—			932	5	0	9,932	5	0	—		
1861 ...	9,000	0	0	1,153	7	0	7	0	0	10,160	7	0	10,134	18	3
1862 ...	9,000	0	0	1,157	10	6	73	10	0	10,231	0	6	9,683	15	11
1863 ...	9,000	0	0	1,059	4	6	90	0	0	10,149	4	6	10,741	0	0
1864 ...	9,000	0	0	1,165	5	0	1,066	16	6	11,232	1	6	12,653	5	5
1865 ...	11,250	0	0	1,346	17	6	323	15	0	12,920	12	6	12,651	14	4

NOTE.—The amounts voted for and expended on buildings are not included in this return.

SCHOOLS.

333. Prior to the year 1862 two systems of education, named respectively the Denominational and the National, were supported by the State in Victoria; but in the September of that year these were blended into one system, under the Common Schools Act (25 Vict., No. 149), which is still in operation.

334. The general provisions of the Common Schools Act are carried out by a Board which is styled the Board of Education. This Board consists of five members, and is a body corporate and politic, capable of suing and being sued. It is provided by the Act that no two members of this Board are to be of one religious denomination.

335. The duties of the Board are to frame regulations for the distribution of the annual grants from the legislature, to determine in what localities schools shall be established and maintained; also to make regulations for the inspection of schools and the examination and classification of teachers, to determine upon the course of secular instruction to be adopted, to fix

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the fees to be charged to the parents of the children, and to make recommendations to the Governor in Council respecting the appointment and removal of officers.

336. It is provided that no school shall receive aid from the revenue unless it has an average attendance of twenty pupils. No religious test is required from any child. Secular education only is provided for; and it is compulsory that four hours be devoted to it daily, of which two are to be in the forenoon and two in the afternoon.

337. A small fee, ranging from 6d. to 2s. 6d. weekly, is charged to all children except those whose parents are in destitute circumstances. The latter are admitted by the teachers under a rule of the Board which grants an allowance for each destitute scholar.

338. The number of Common Schools in operation at the end of 1865 was 676, being an increase of 29 during the year.

339. The number of children on the school rolls in 1865 was 64,926, and the number in average attendance was 49,218, against 57,098 on the rolls and 41,539 in average attendance in the previous year.

340. The average number of children on the rolls of each school was 88 in 1864, and 96 in 1865. The average attendance at each school was 64 in 1864, and 73 in 1865.

341. In 1864, 72½ per cent. of the children on the roll were in average attendance. This proportion in 1865 had increased to nearly 76 per cent.

342. The number of destitute children who received free education in 1864 was 6404. This number had increased to 9988 in 1865. There is reason to believe that the bounty of the State in regard to destitute scholars is in many cases abused.

343. Returns of the sexes of the scholars in 1865 show that 55 per cent. of the whole were boys, and 45 per cent. were girls.

344. The number of teachers in 1865 was as follows:—Males, 852—comprising 661 masters, 116 assistants, 75 pupil teachers; females, 763—namely, 84 mistresses, 568 assistants, 111 pupil teachers; or in all 1615 instructors of both sexes.

345. The following is a statement of the receipts from all sources in 1865:—

GOVERNMENT AID.			
Salaries	£97,037	3	2
Fees for Destitute Children	9,535	13	11
Payments for Results	23,563	19	10
Total from Government	£130,136	16	11
FROM PRIVATE SOURCES.			
School Fees, &c.	68,117	13	3
Total	£198,254	10	2

PRIVATE SCHOOLS.

346. In addition to the schools subject to the Educational Board, there are a number of private schools established in different parts of the colony. Some of these are Collegiate and Grammar Schools, and in establishments of this description a very superior class of instruction is imparted.

347. The following are the principal colleges and grammar schools in Victoria, and the religious denominations with which they are severally connected, together with the number of teachers and scholars at the end of 1865:—

TABLE LXXV.—COLLEGES, GRAMMAR SCHOOLS, &c.; 1865.

NAME OF INSTITUTION.	What Religious Denomination connected with.	Number of Masters or Professors.	NUMBER OF SCHOLARS. Boarders.	Day Pupils.	Total.
Melbourne Grammar School...	Church of England...	8	30	160	180
St. Patrick's College, Melbourne	Roman Catholic	3	—	34	34
Scotch College, Melbourne ...	Presbyterian	15	40	200	240
Congregational College, Melbourne*........................	Independent	5	[illegible]	—	6
Geelong Grammar School......	Church of England...	4	15	40	55
Geelong College	Presbyterian	5	27	85	112
	Total......	40	118	509	627

348. None of these institutions at present receive any aid from the State, but £14,000 was granted some years back towards building the Melbourne Grammar School, and £6445 towards the erection of the Scotch College. At the former establishment an exhibition of the value of £21 per annum, and tenable for three years at the school, is awarded every year to all competitors without distinction under fourteen years of age.

349. The number of private schools other than collegiate and grammar schools was 380 at the end of 1865. At 24 of these only boys, and at 37 only girls, were educated. At the remainder, children of either sex were received. The number of teachers was 633, of whom 201 were males, and 432 were females. The children receiving education numbered 10,757, of whom 4912 were boys, and 5845 were girls.

350. The following is a summary of the different descriptions of schools, and the teachers and scholars connected with each:—

DESCRIPTION OF SCHOOL.	Number of Schools.	Number of Scholars.
Common Schools	676	64,926
Colleges and Grammar Schools	6	627
Other Private Schools	380	10,757
Total.................	1062	76,310

351. In the last ten years great advances have been made in the number of schools, both public and private, and in the attendance of scholars. These points will be at once observed in the following table.

TABLE LXXVI.—PUBLIC AND PRIVATE SCHOOLS, 1856-1865.

YEAR.	SCHOOLS RECEIVING AID FROM THE REVENUE. Number of Schools.	Number of Scholars. Boys.	Girls.	Total.	PRIVATE SCHOOLS. Number of Schools.	Number of Scholars. Boys.	Girls.	Total.
1856......	456	13,654	12,385	26,039	—	—	—	—
1857......	540	17,481	15,753	33,234	135	1348	2089	3,437
1858......	595	20,610	18,277	38,887	145	1569	1976	3,545
1859......	605	22,663	19,698	42,361	167	1346	2558	3,904
1860......	665	25,167	21,520	46,687	221	1938	3043	4,981
1861......	671	28,120	23,225	51,345	211	1968	3160	5,128
1862......	673	31,268	25,883	57,151	316	3633	4757	8,390
1863......	648	32,150	26,369	58,519	371	5037	6063	11,100
1864......	647	31,450	25,532	56,982	300	4120	5043	9,163
1865......	676	35,709	29,217	64,926	386	5539	5845	11,384

* The return of this Institution is for 1864; that for 1865 has not been furnished

352. The Royal Commission on Education, appointed in September, 1866, will, in all probability, close its labours early in 1867. Some extracts from tables furnished by me in evidence before that Commission will be found in Appendix F. The figures there given will show the rapid strides made by Victoria towards universal elementary public instruction.

INDUSTRIAL AND REFORMATORY SCHOOLS.

353. Industrial and Reformatory Schools have been established in Victoria under the "Neglected and Criminal Children's Act" (27 Vic., No 216).

354. By this Act, which became law in the middle of 1864, it is provided that children begging or receiving alms, having no visible means of subsistence, residing in brothels or dwelling with bad characters, having committed a punishable offence, or being unable to be controlled by parents, may be sent, by two or more Justices of the Peace, to an Industrial School, for a period of from one to seven years. It was also provided that children being inmates of the Immigrants' Home at the time of the passing of the Act, should be transferred to the Industrial Schools.

355. The Act further provides that any child convicted of an offence punishable by law might, at the discretion of the judge or other officer by whom such child was convicted, be sent, at the expiration of its sentence, to a Reformatory School, for not less than one, nor more than seven years.

INDUSTRIAL SCHOOLS.

356. There are six Industrial Schools in different parts of the colony, viz.:—One for children of both sexes, at Melbourne, and another at Geelong; one for boys only, at Sunbury; a naval training-ship for boys, in Hobson's Bay; a Roman Catholic school for girls, at Abbotsford, near Melbourne; and a Roman Catholic School for girls, at Geelong.

357. These institutions contain 34 wards, with an aggregate space of 708,455 cubic feet. The total number of beds they make up is 1075, viz., 741 for boys (including 100 hammocks on board the naval training-ship) and 334 for girls. The total number of children in the schools at the end of 1865 was 1222, viz., 649 boys and 573 girls. The number of children returned was thus in excess of the number of beds.

358. The expenditure of the Industrial Schools in 1865 amounted to about £24,000, of which all but £270 was from Government.

REFORMATORIES.

359. The reformatory school for boys is on board the hulk "Deborah," moored in Hobson's Bay. This vessel contains accommodation for 200 boys, and there were 84 in detention there at the end of 1865. Of these 58 had been convicted of felonies, and 26 of misdemeanours.

360. Up to the end of 1865 no reformatory school for girls had been established; but one has since been founded at Sunbury, in which about 20 criminal girls are detained.

ELECTORAL FRANCHISE.

361. Universal manhood suffrage obtains in Victoria, so far as the Lower House, or Legislative Assembly, is concerned. Electors for the

Upper House, or Legislative Council, must either possess a freehold property qualification of £1000 absolute or £100 annual value, or else must be officers or retired officers in the army or navy, members of the learned professions, or graduates of universities.

362. The following is the result of the last election for both Houses, so far as the number of electors on the rolls, and the number who recorded their votes, is concerned:—

TABLE LXXVII.—NUMBER OF VOTERS AT LAST ELECTIONS.

Houses.	Number of Voters on the Roll.			Number of Voters who recorded their Votes.	Per centage of those who recorded their Votes, to the whole number of Electors in contested Districts.
	In Provinces and Districts wherein the Election was contested	In Provinces and Districts wherein the Election was uncontested.	Total.		
Legislative Council...	5,850	3,859	9,709	3,526	60·3
Legislative Assembly	96,267	15,729	111,996	53,097	55·1

CONCLUSION.

363. The foregoing summary will, it is hoped, not only afford a clear and satisfactory exposition of the general progress of the country, but lead many of its readers to a more thorough investigation of the great store of valuable data recorded in our large volume of statistics annually laid before Parliament.

APPENDIX.

APPENDIX A.

MOUNTAINS IN VICTORIA.

Name.	Locality.	Approx. height above level of sea.
		Feet.
Abrupt ...	County of Dundas ...	...
Acland ...	,, Polwarth	...
Aitken ...	,, Bourke ...	...
Aitken's Hill	,, ,, ...	...
Alexander ...	,, Talbot ...	2435
Alexander's Head ...	,, Bourke ...	...
Almoid, Pk. of	,, Ripon ...	...
Anche Youang	,, Grant ...	...
Anderson's Hl.	,, Hampden	...
Angus ...	,, Gippsland	...
Arapiles ...	District of Wimmera	...
Ararat ...	County of Ripon ...	...
,, ...	,, Mornington	...
Arthur's Seat	,, ,,	...
Atkinson ...	,, Bourke ...	...
Bald Head ...	Gipps Land District	4643
Bainbridge ...	Dundas County ...	...
Baranheit ...	District of the Murray	...
Barker ...	County of Talbot ...	...
Barnard ...	District of the Murray	...
Battery, or Beolite	,, ,,	...
Battery Hill...	County of Normanby	...
Baw Baw ...	,, Evelyn ...	...
Bear's Hill ...	District of the Loddon	...
Beckworth ...	County of Talbot ...	...
Benambra ...	District of the Murray	...
Ben Cruachan	,, Gippsland	2912
Ben Nevis ...	,, the Wimmera	...
Big Hill ...	County of Bourke ...	...
Big Hill ...	,, Evelyn ...	...
Birch Hill ...	,, Talbot ...	...
Black ..	,, Rodney ...	...
Black Hill ...	,, Grant ..	...
Black Hill ...	,, Grenville	...
Black Range...	,, Anglesey	...
Black Range...	,, Polwarth	...
Black Range...	District of the Wimmera	...
Blackwood, or Myrniong ...	County of Bourke ...	...
Blowhard ...	,, Ripon ...	...
Blue Range ...	District of the Murray	...
Bogong Range	,, ,,	...
Bolga ...	,, ,,	2860
Bolton ...	County of Talbot ...	...
Boramboot ...	,, Rodney ...	...
Boulder Range	District of Gippsland	1010
Boundary Hill	County of Anglesey	...
Brenanah, or Sunday Mng. Hill ...	District of the Loddon	...
Brigg's Bluff...	,, Wimmera	...
Brock's Hill ...	County of Bourke ...	...
Brown's Hill...	,, Heytesbury	...
Bryarty's Hills	,, Evelyn ...	...
Budgee Budgee	District of Gippsland	...
Buffalo Mnts...	,, the Murray	...
Bulla Bulla ...	,, Gippsland	...
Bullancrook ...	County of Bourke ...	...
Bullarook ...	,, Talbot ...	2400
Buller ...	District of Gippsland	5330
Bullioh ...	,, the Murray	2360
Buninyong ...	County of Grant ...	...
Burrumbeep Hills ...	,, Ripon ...	...
Bute ...	,, Grenville..	...
Camel ...	,, Rodney ...	...
Cardinal, The	,, Ripon ...	...
Castle Hill ...	District of Gippsland	4860
Cathedral ...	County of Anglesey..	...
Cavern ...	,, Talbot ...	...
Christmas Hills	,, Evelyn ...	...
Clarke ...	,, Hampden	...
Clay ...	,, Normanby	...
Coast Hill ...	District of Gippsland	...
Cobboras ...	Gipps Land and Murray Districts	5000 to 6000; accdg. to some authorities, 7000
Coghill's Hill..	County of Talbot ...	...
Cole ...	,, Ripon ...	...
Colite ...	,, Grant ...	...
Concord ...	,, Anglesey..	1500
Conical Hill ...	,, Bourke ...	...

APPENDIX A.—MOUNTAINS IN VICTORIA.

Name.	Locality.	Approx. height above level of sea.
		Feet.
Consultation...	County of Talbot ...	...
Cooy-a-long ...	District of the Murray	3270
Corranwarrabul ...	County of Mornington	...
Cotterill ...	,, Bourke ...	...
Cunningham...	,, Anglesey ...	...
Curtmeeton ...	,, Hampden...	...
Dargo Hill ...	District of Gippsland	...
Darriwil ...	County of Grant ...	...
Delegete Hill..	District of Gippsland	...
Despair ...	County of Anglesey...	...
Dingle Range	District of the Murray	...
Diogenes ...	County of Bourke ...	...
Direction ...	District of the Wimmera	...
Disappointment ...	County of Bourke ...	2000
Drummond ...	District of the Wimmera	...
Dryden ...	District of the Wimmera	...
Duneed ...	County of Grant ..	...
Eccles ...	,, Normanby	590
Eckersley ...	,, Normanby	...
Egerton ...	,, Grant ...	...
Elephant ...	(See Clarke)	...
Eliza	County of Mornington	...
Emu	,, Ripon ...	...
Emu	,, Hampden	...
Enterprise ...	,, Murray ...	...
Erip	,, Grenville	...
Fainting Range	District of Gippsland	...
Fatigue ...	,, Gippsland	2110
Forest Hill ...	Murray and Gippsland districts, close to N.S.W. frontier	5000
Forest Hill ...	County of Talbot ...	...
Franklin (Larne-barramul)	,, Talbot ...	2092
Fyans... ...	,, Hampden	...
Gamo, or Garvoc	,, Hampden	...
Gap	,, Talbot ...	...
Gaspard ...	,, Talbot ...	...
Gellibrand ...	,, Grenville	...
Genoa Point...	District of Gippsland	...
George ...	County of Polwarth	...
Gibbo Range	District of the Murray	5000
Glasgow ...	County of Talbot ...	...
Gowar ...	District of Avoca ...	...
Granya ...	,, the Murray	3620
Green Hill ...	County of Dalhousie	...
Green Hill ...	,, Grenville	...
Greenock ...	,, Talbot ...	...
Hardie's Hill...	,, Grenville	...
Hat Hill ...	District of the Murray	...

Name.	Locality.	Approx. height above level of sea.
		Feet.
Heape ...	District of the Loddon	...
Hermit ...	,, Murray	...
Hesse... ...	County of Grenville	...
Hoddle Range	District of Gippsland	...
Holden ...	County of Bourke ...	...
Hollow Back Hill... ...	,, Talbot ...	...
Howe... ...	District of Gippsland	1250
Hunter ...	,, Gippsland	1138
Ida	County of Rodney ...	2000
Kangaroo Rge.	,, Normanby	...
Kensop Peak	District of Gippsland	740
Kent	,, Gippsland	5129
Kerang ...	,, the Loddon	...
Kerange Moorah	County of Polwarth	...
Kincaid ...	,, Normanby	722
Kirk's Hill ...	,, Ripon ...	...
Koala... ...	,, Dalhousie	...
Koang ...	,, Hampden	...
Kooroongh ...	,, Talbot ...	...
Kooyoora ...	District of the Loddon	...
Korong ...	,, Loddon	...
Kororoit ...	County of Bourke ...	...
Lady Mount...	,, Ripon ...	...
Langi Ghiran..	,, Ripon ...	...
Latrobe ...	District of Gippsland	2590
Latrobe's Rge.	County of Polwarth	...
Lawaluk ...	,, Grenville	...
Leading Hill...	,, Mornington	...
Leura... ...	,, Hampden	...
Macedon ...	,, Bourke ...	3400
Mackenzie ...	,, Anglesey	...
Martha ..	,, Mornington	...
Maxwell ...	,, Anglesey	740
Melbourne Hill	,, Bourke	...
Mercer ...	,, Grenville	...
Meuron ...	,, Polwarth	...
Miningorat ...	,, Hampden	...
Misery ...	,, Ripon ...	...
Moliagul ...	District of the Loddon	...
Monda ...	County of Evelyn ...	...
Monk	,, Talbot ...	...
Moornbool ...	,, Ripon ...	...
Moornbool ...	,, Rodney ...	...
Moorookyle ...	,, Talbot ...	...
Moorul ...	District of the Loddon	...
Moriac ...	County of Grant ...	...
Murra-marung-bun ...	District of the Murray	...
Napier ...	County of Normanby	1440
Native Dog Peak ...	District of the Murray	...
Nercarardel ...	County of Anglesey	...
Noorat ...	,, Hampden	...
Notch Hill ...	District of Gippsland	4625

APPENDIX A.—MOUNTAINS IN VICTORIA.

Name.	Locality.	Approx. height above level of sea.
		Feet.
One-mile Hill	County of Talbot ...	...
One-tree Hill	,, Evelyn ...	...
Pierre Point ...	,, Normanby	891
Pine Mount ...	District of the Murray	...
Pininbar ...	,, ,,	4100
Pisgal... ...	County of Ripon ...	...
Pleasant ...	,, Rodney ...	...
,, ...	District of the Murray	...
Pollock ...	County of Grant ...	...
Porndon ...	,, Heytesbury	...
Prospect ...	,, Anglesey..	...
Puzzle Range..	,, ,, ..	...
Pyramid Hill..	District of the Loddon	...
Quoin Hill ...	County of Talbot ...	...
Ravenscroft Hl	,, Ripon ...	...
Red Hill ...	District of the Murray	...
Richmond Hill	County of Normanby	727
Riddell ...	,, Evelyn ...	...
Ross ...	,, Ripon ..	...
Round Backed Hill... ...	District of Gippsland	...
Rouse ...	County of Villiers ...	1220
Sandstone Rgs.	,, Rodney ...	...
Sargent ...	District of the Loddon	...
Separation ...	,, the Murray	...
Serra Range...	County of Dundas ...	...
Shadwell ...	,, Hampden	...
Sheac Hill ...	,, Bourke ...	...
Sherwin's ...	,, Evelyn ...	...
Singapore ...	District of Gippsland	451
Sister Rises ...	County of Hampden	...
Sisters ...	,, Anglesey..	...
Spring Hill ...	,, Ripon ...	...
Spring Hill ...	,, Talbot ...	...
Smeaton ...	,, ,, ...	...
Snake's Ridge	District of Gippsland	...
Snodgrass ...	County of Anglesey..	...
Snowy Bluff ...	District of Gippsland	...
Stavely Range	County of Villiers ...	...
Steel's Hill ...	,, Evelyn ...	...
Steiglitz ...	,, Bourke ...	...
St. Leonard's..	,, Evelyn ...	...
St. Mary's Hill	,, Ripon ...	...
Strathbogie Ranges ...	District of the Murray	...
Sturgeon ..	County of Dundas ...	...
Sugarloaf ...	,, Anglesey..	...
,, (Bear's)	,, Evelyn ...	...
Sugarloaf ...	District of the Murray	...
,, or Mt. Piper ...	County of Dalhousie	...
Sugarloaf Rgs.	,, Evelyn ...	...
Surface Hill ...	District of the Loddon	...
Survey Peak...	County of Anglesey..	...
Table Top ...	District of the Murray	...
Talbot ...	,, the Wimmera	...
Tambo ...	,, the Murray...	...
Tamboritha ...	,, Gippsland.....	5381
Tarrangower...	,, the Loddon...	...
Taylor ...	,, Gippsland.....	1463
TerrickTerrick	,, the Loddon...	...
Timbertop, or Warrambat..	,, the Murray...	...
Thorpe ...	,, the Loddon...	...
Tom's Leap ...	,, Gippsland.....	1328
Tooboora Hills	County of Dalhousie	...
Torbreck ...	,, Anglesey..	...
Tower Hill ...	,, Villiers ...	...
Trawaal ...	,, Anglesey..	...
Valentia ...	District of Gippsld.	3000 to 4000
Victoria Range	County of Dundas ...	...
View Hill ...	District of the Loddon	...
Vite Vite ...	County of Hampden	...
Wagra ...	District of the Murray	2638
Wallace ..	County of Grant ..	...
Warrenheip ...	,, Grant ...	2437
Warrion Hill, Great ...	,, Grenville..	...
Warrnambool	,, Hampden	...
Watershed Hl.	,, Ripon ...	...
Wellington (Mt Gisborne, Strzelecki, Nap Nap, Marra N. Black).. ...	District of Gippsld.	5269
William ...	,, the Wimmera	5000 to 6000
Will's Hill ...	County of Ripon ..	...
Wilson ...	District of Gippsland	2350
Wilsone ...	County of Bourke ...	...
Wiridgil ...	,, Hampden	...
White Hill ...	District of the Loddon	...
White Horse Hill ...	,, ,, ...	...
Wombat ...	District of the Murray	...
Wombat Hill..	County of Talbot ...	...
Yandoit Hill...	County of Talbot ...	...
Zero Mount ...	District of the Wimmera	...

APPENDIX B.

NAMES OF RIVERS IN VICTORIA.

Name.	Position.	Approximate Length.
		Miles.
Agnes	Gippsland. Corner inlet, west of Welshpool	15
Aire	Polwarth. Falls into the sea six miles west of Cape Otway	15
Albert	Gippsland, at Alberton	25
Avoca	Loddon District, at western boundary thereof	130
Avon, or Dunlop	Gippsland. Flows into Lake Wellington	80
Avon	Wimmera District. Source about one mile north of Navarre	[illegible]
Balloch	Mornington. Falls into Western Port N	10
Barwon	Grant. Runs into Lake Connewarre, part of west boundary of county	70
Bass	Mornington. Falls into Western Port near East Head	20
Big	Murray District. Joins Goulburn 16 miles S.W. of Mansfield	20
Broken	Murray District. Joins Goulburn two miles S. of Shepparton	85
Buckland	Murray District. South of Ovens, 40 miles S.E. of Wangaratta	25
Buffalo	Murray District. South of Ovens, 25 miles S.E. of Wangaratta	25
Calder	Polwarth. Falls into Lake Craven seven miles W. of Cape Otway	10
Campaspe	Dalhousie, at Kyneton. Flows into Murray at Echuca	85
Coliban	Dalhousie. Boundary between the counties of Talbot and Dalhousie. Flows into the Campaspe	45
Coliban, Little	Dalhousie	12
Crawford	Normanby. Joins the Glenelg at Dartmoor	23
Cray	Polwarth. Falls into sea at Cape Patton	10
Dargo	Gippsland. Joins Mitchell River about 34 miles north of Lake Wellington	45
Delatite, or Devil's	Murray District. Joins Merton Creek about 12 miles S.E. of Merton	40
Dingaringo	Gippsland. About 12 miles east of Snowy River, near N.S.W. boundary	10
Don	Evelyn. Joins Yarra Yarra 24 miles N.E. of Warrandyte	7
Dundas	Dundas. Joins Wannon 1½ miles west of Cavendish	10
Emanga	Murray District. Joins Mitta Mitta about 38 miles N.W. of Lake Omeo	30
Eumerella	Normanby. Falls into sea 10 miles west of Belfast	55
Fitzroy	Normanby. Falls into sea six miles east of Narrawong	20
Franklin	Gippsland, at Corner Inlet, west of Welshpool	15
Gellibrand	Heytesbury. Falls into sea 23 miles west of Cape Otway	30
Genoa	Gippsland. Falls into sea 12 miles S.W. of Cape Howe	45
Gibbo	Murray. Between Mounts Bulioh and Wagra	25
Glenelg	Normanby. Part of west boundary of county	205
Goulburn	Anglesey. Part of west boundary of county. Joins Murray six miles east of Echuca	230
Holland	Murray. Sources at Wombat Hill and Tabletop	35
Hopkins	Villiers. Falls into sea at Warrnambool	110
Howqua	Murray. Sources at Goulburn, 12 miles S. of Mansfield	15
Innomungee	Murray District. Joins Mitta Mitta about 16 miles N.W. of Lake Omeo	15
Jerusalem	Anglesey. Part of east county boundary	25
Jingallala	Gippsland. Joins the Snowy River	27

APPENDIX B.—NAMES OF RIVERS IN VICTORIA.

Name.	Position.	Approximate Length.
		Miles.
Kennett	Polwarth. Falls into sea at Point Hawdon	5
King	Murray District. Joins the Ovens at Wangaratta	45
Latrobe	Gippsland. Falls into Lake King	70
Leigh	See Yarrowee	—
Lerderderg	Bourke. Joins Goodman's Creek about 2 miles N. of Darley	18
Limestone	Murray District. About 8 miles N. of Murray sources	18
Little	Grant, at Rothwell	25
Little	Murray District. Joins Mitta Mitta 8 miles from its junction with the Murray	15
Little, or Kiewa Creek	Murray District. Joins Murray 3 miles east of Belvoir	35
Loddon	Loddon District. Joins Murray at Swan Hill	150
Macalister	Gippsland. Falls into Lake Wellington	65
Merri	Villiers. Falls into sea at Warrnambool	20
Mitchell	Gippsland. Falls into Lake King	60
Mitta Mitta	Murray District. Joins Murray River about 8 miles east from Belvoir	90
Moorabool	Grant. Joins Barwon at Fyansford, about 6 miles from mouth of Yarrowee	55
Moroka	Gippsland. Joins Wannangatta 14 miles N.E. of Mount Buller	15
Moyne	Villiers. Falls into sea at Belfast	2
Murray	(Waaring). Northern boundary line of the colony of Victoria	670
Murrumgeh	Gippsland. Falls into Genoa River	5
Nicholson	Gippsland. Falls into Lake King	25
Ovens	Murray District. Joins Murray 40 miles W. of Belvoir	100
Parker	Polwarth. Falls into sea 4 miles E. of Cape Otway	10
Perry	Gippsland. Falls into Lake King	25
Plenty	Bourke. East boundary of county	30
Powlett	Mornington. Falls into sea 11 miles S.E. of East Head	15
Richardson	Wimmera District. Joins Avon River about 26 miles N.W. from Navarre	30
Saltwater River	Bourke, at Footscray. Falls into Hobson's Bay	70
Shaw	Villiers. Falls into sea at Narrawong	18
Sherbrooke	Heytesbury. Falls into sea 29 miles W. of Cape Otway	5
Snowy	Gippsland District. Falls into sea 50 miles W. of Ram Head	85*
Stokes, or Emu	Normanby. Joins the Glenelg 5 miles N. of Dartmoor	25
Surrey	Normanby. Falls into sea at Narrawong	18
Tambo, or Thompson	Gippsland. Falls into Lake King	85
Tarra Tarra	Gippsland. Falls into the sea at Tarraville township	25
Tarwin	Gippsland. Falls into the sea at Anderson's Inlet	35
Tarwin	Gippsland. Falls into the sea at Corner Inlet South	5
Tellicurd	Gippsland. Joins the Snowy River	5
Toolaway	Gippsland. Falls into the sea about 10 miles W. of Ram Head	5
Toonginbooka	Gippsland. Joins Snowy River about 50 miles from its entrance to the sea	15
Wallangarangh	Gippsland District. Genoa River runs into it	5
Wannon	Dundas. Part of south boundary of county	105
Wentworth	Gippsland. About 30 miles N. of Lake Wellington	25

* Length in Victoria.

APPENDIX B.—NAMES OF RIVERS IN VICTORIA.

Name.	Position.	Approximate Length.
		Miles.
Werribee	Bourke. West boundary of county	55
Whourouly	Murray District. Joins Ovens about 15 miles S.E. of Wangaratta	23
Wimmera	Wimmera District. At Dividing Range about 7 miles south of Elmhurst	135
Wongaugarra	Gippsland District. Mitchell River, about 43 miles N.W. of Lake Wellington	30
Wonnangatta	Gippsland District. Joins the Wongaugarra River about 44 miles N. of Lake Wellington	35
Woori Yaloak	Evelyn. Joins Yarra Yarra about 4 miles W. from Warrandyte	20
Wright, or Bourne	Mornington. About 8 miles S.E. of East Head, on coast	15
Wye	Polwarth. Falls into sea at Point Sturt	3
Yarra Yarra	Bourke. Falls into Hobson's Bay	90
Yarrowee, or Leigh	Grant. Joins the Barwon at Inverleigh	50

APPENDIX C.

NAMES OF LAKES IN VICTORIA.

Name.	Position.	Approximate Area.
		Acres.
Albacutya	Wimmera District, 10 miles N. of Lake Hindmarsh	13440
Bael Bael	Wimmera District, 25 miles S.E. of Castle Donnington	1280
Baker	Wimmera District, six miles S.E. of Castle Donnington	400
Beeac	Grenville, 10 miles N. of Colac	1400
Boga	Wimmera District, eight miles S.E. of Castle Donnington	1920
Boga (of Sir T. Mitchell)	Wimmera District, eight miles S.E. of Horsham	—
Bokaar	Hampden, nine miles N.W. of Camperdown	800
Boloke	Ripon, five miles S.E. of Wickliffe	3840
Bridebash	Hampden, nine miles N.W. of Camperdown	50
Bring Albort	Wimmera District, 12 miles N.W. of Apsley	200
Bugurnlipurt	Loddon District, four miles N. of Kerang	600
Bullen Merri	Hampden, one mile W. of Camperdown	1500
Buloke	Wimmera District, 38 miles N. of Navarre	8960
Bunga	Gipps Land, three miles S.W. of Lake Tyers	300
Bungaa	Gipps Land, two miles S. of Lake King	5120
Buninjon	Ripon, 14 miles S.W. of Ararat	500
Burrumbeet	Ripon, 10 miles W. of Ballarat	5440
Cannu	Wimmera District, five miles S.E. of Apsley	80
Cantalla	Wimmera District, 45 miles N.W. of north shore of Lake Tyrrell	150
Cartcarrying	Villiers, N.E. corner of parish of Yarpturk	110
Catherine	Polwarth, W. boundary of county, 18 miles from the sea	96
Charm	Loddon District, 10 miles N. of Kerang	1280
Clear Lake	Wimmera District, 17 miles N.E. of Moyston	400
Colac	Polwarth, at Colac	6400
Colongulac	Hampden, three miles N. of Camperdown	5120
Condah (lake and swamp)	Normanby, 12 miles N.W. of Heywood	3840

APPENDIX C.—NAMES OF LAKES IN VICTORIA.

Name.	Position.	Approximate Area.
		Acres.
Connewarre	Grant, four miles S. of Geelong	7680
Connewarren	Hampden, 20 miles N. of Warrnambool	640
Cooper	Rodney, nine miles E. of Runnymede	3840
Coorong	Wimmera District, 24 miles E. of Lake Albacutya	200
Coragulac	Grenville, eight miles N.W. of Colac	300
Craven	Polwarth, seven miles W. of Cape Otway	1280
Denison	Gipps Land, 28 miles N.E. of Alberton	4800
Doling Doling	Dundas, three miles N.E. of Hamilton	30
Elingamite	Heytesbury, 10 miles S.W. of Camperdown	70
Eyang	Hampden, 31 N.W. of Camperdown	300
Garnouk	Wimmera District, 10 S.E. of Castle Donnington	500
Gherang Gherang	Grant, three miles E. of Winchelsea	200
Guarpurt	Hampden, at northern extremity of Lake Korangamite	6400
Gnotuk	Hampden, two miles W. of Camperdown	600
Gundare	Grenville, 14 miles N. of Colac	600
Hindmarsh	Wimmera, 47 miles N.W. of junction of the Warrambeach Creek and Wimmera River	35840
Kariar	Hampden, eight miles N.E. of Camperdown	300
Keilambete	Hampden, 15 miles W. of Camperdown	1500
Kennedy	Villiers, eight N.W. of Penshurst	500
King	Gipps Land, 23 miles N.E. of Seacombe	13440
Kolora	Hampden, 20 miles N.W. of Camperdown	50
Konardin	Wimmera, 44 miles N.W. of north shore of Lake Tyrrell.	300
Konnendkar	Hampden, 19 miles N.W. of Camperdown	60
Koo-wee-rup	Mornington, the Great Swamp	76160
Korangamite	Grenville and Hampden	48640
Koreetnung	Hampden, seven miles N.E. of Camperdown	1300
Koroit	Villiers, six miles N.E. of Belfast	2240
L'Albert	Wimmera District, 25 miles S.W. of Castle Donnington	1600
Leagur	Loddon District, 18 miles S.W. of Kerang	500
Learmonth	Ripon, 11 miles N.W. of Ballarat	1200
Linlithgow	Villiers, nine miles north of Penshurst	1920
Lonsdale	Wimmera, seven miles S.W. of Glenorchy	2560
Malim	Ripon, 16 miles S.W. of Ararat	40
Mannaor	Wimmera District, 10 miles S.E. of Castle Donnington	40
Merring	Loddon District, 11 miles S.W. of Kerang	700
Mitre	Wimmera District, 40 miles south of Lake Hindmarsh	1600
Modewarre	Grant, five miles east of Winchelsea	1280
Mournpole	Wimmera District, 44 miles N.W. of Lake Tyrrell	1280
Munday	Follett, 24 miles west of Casterton	1920
Murdeduke	Grenville, 25 miles west of Geelong	3840
Natimuck	Wimmera, 14 miles west of Horsham	500
Necea (Bunbury's Marsh)	Ripon, 13 miles S.W. of Ararat	2560
Ondit	Grenville, eight miles N.W. of Colac	300
Pertobe	Villiers, town of Warrnambool	50
Purgagoolah	Gipps Land, 18 miles west of Cape Howe	80
Reeve	Gipps Land, two miles S.E. of Seacombe, on coast	26880
Repose	Villiers, eight miles east of Dunkeld	400
Salt Lakes	Wimmera District, 46 miles N.W. of Lake Albacutya	4480
Swan	Mornington, in Phillip Island	200

APPENDIX C.—NAMES OF LAKES IN VICTORIA.

Name.	Position.	Approximate Area.
		Acres.
Tarragal	Normanby, in parish of Tarragal	15
Tatutong	Hampden, 15 miles N.E. of Camperdown	60
Terang	Hampden, 12 miles west of Camperdown	500
Terang Goodwitch	Hampden, 15 miles east of Camperdown	40
Terang Pom	Hampden, 13 miles N.W. of Camperdown	300
Timboon	See Colongulac	—
Tyers	Gipps Land, 22 miles west of mouth of Snowy River	5760
Tyrrell	Wimmera District, 36 miles west of Castle Donnington	45440
Victoria	Gipps Land, at Seacombe township	58240
Walwalla	Wimmera District, 13 miles S.E. of intersection of South Australian boundary line by Murray River	600
Wangoom	Villiers, six miles N.E. of Warrnambool	500
Waranga	Rodney, four miles E. of Rushworth	—
Weeranganuk	Hampden, eight N. of Camperdown	850
Weering	Grenville, 19 miles N. of Colac	1300
Wellington	Gipps Land, 50 miles N.E. of Alberton, at Seacombe	46080
White	Wimmera, eight miles N.W. of Mostyn	1920
White Stone	Ripon, 18 miles N.W. of Ballarat	—
Wirraan	Hampden, nine miles N. of Camperdown	60
Woolonguwoong	Hampden, 10 miles N. of Camperdown	90
Wurdee Boluc	Grant, three miles S.E. of Winchelsea	600
Yambuk	Villiers, 10 miles W. of Belfast	60
Yelwell	Wimmera, 44 miles N.W. of Lake Tyrrell	640
Yerang	Wimmera, 44 miles N.W. of Lake Tyrrell	1920

APPENDIX D.

Registrar-General's Office,
Melbourne.

Memorandum.—The contents of any individual schedule will not be made known to the public. The numerical results of all the schedules combined will alone be published. It is therefore to be understood that the information furnished in this paper, by or on behalf of any occupier, will be considered confidential.

William Henry Archer,
Registrar-General.

OCCUPIER'S SCHEDULE.
(To be signed by the Occupier.)

Name of County or Unsettled District
Name of Parish
Name of Holder

		Area.	
Extent of Holding ...	Freehold	acres	... ...
	Purchased Land rented	acres	... ...
	Crown Land rented	acres	... ...
	Total ...	acres	
Extent of Land enclosed		acres	... ...
Extent cultivated*		acres	... ...

* The "Extent Cultivated" must balance exactly with the sum of the Number of Acres under all the different crops; it should not, therefore, be filled in until the other particulars are entered. The areas in fallow and laid down in permanent artificial grass are to be included in the extent cultivated.

APPENDIX D.—OCCUPIER'S SCHEDULE.

GRAIN CROPS.			GROSS PRODUCE.	
Wheat ...			acres	bushels
Oats...			acres	bushels
Barley { English	acres	bushels	acres	bushels
Barley { Cape	acres	bushels		
Maize ...			acres	bushels
Rye	acres	bushels	acres	bushels
Bere	acres	bushels		
Peas	acres	bushels	acres	bushels
Beans	acres	bushels		
Millet	acres	bushels		
Sorghum	acres	bushels		

GREEN CROPS.

(Exclusive of Market and Kitchen Gardens.

Potatoes ...			acres	tons
Turnips ...			acres	tons
Mangel Wurzel ...			acres	tons
Beet	acres	tons	acres	tons
Carrots	acres	tons		
Parsnips	acres	tons		
Cabbage	acres	tons		

HAY.

Cereal Grasses—Oats, Wheat, &c.	acres	tons	acres	tons
Rye Grass, Lucerne, &c.	acres	tons		

GREEN FORAGE.

Cereal Grasses—Barley, Wheat, Oats, &c. ...	acres	... ...
Maize ...	acres	... ...
Rye Grass, Lucerne, Clover, Vetches, &c. ...	acres	... ...
Sorghum ...	acres	... ...
In permanent artificial grass ...	acres	... ...

OTHER CROPS.

Onions ...	acres	cwt.
Tobacco ...	acres	cwt.

Vines {
- Extent of Plantation ... acres ... ...
- Age ... { Under 1 Year (including cuttings) ... ... No.
- Under 2 Years ... ... No.
- Under 3 Years ... ... No.
- 3 Years and upwards ... ... No.
- Total Number ... ...
- Quantity of Grapes not made into wine or brandy ... cwt.
- Quantity of Grapes made into wine or brandy ... ... cwt.
- Total Quantity of Grapes gathered... ... cwt.
- Wine made ... ... gals.
- Brandy made (exclusive of that for fortifying wine) ... gals.

Other crops ...	acres	... ...
Garden ...	acres	... ...
Orchard ...	acres	... ...
Land in Fallow ...	acres	... ...

NUMBER OF LIVE STOCK.

Horses . Milch Cows . Other Cattle . Sheep . Pigs

AVERAGE NUMBER OF HANDS EMPLOYED, INCLUDING PROPRIETOR OR MANAGER.

Males . Females .

AGRICULTURAL MACHINERY AND IMPLEMENTS.

Number and Description *

Number of Steam Engines (if any) ; Horse-power

Approximate Value of Farming Plant and Machinery, £

Crops reaped and mowed by machines ... acres ... ...

Land ploughed by Steam Plough ... acres ... ...

Signature of Occupier.

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* State Number of Ploughs, Harrows, Carts, Threshing Machines, Reapers, Mowers, Wine Presses, and all other Agricultural Implements and Machines on the Farm.

NOTE.—In making return of "PRODUCE," the *gross quantity* of each description of crop is to be given, *not the yield per acre*. Where two crops have been obtained off the same piece of land during the season, the number of acres under the second crop and the produce thereof are to be noted in the margin.

APPENDIX E.

IMMIGRATION REGULATIONS.

The following is a copy of the Government regulations at present in force for the introduction into Victoria of immigrants from the United Kingdom, either wholly or partially at the public expense. (See page 21.)

No. I.

REGULATIONS FOR THE SELECTION OF EMIGRANTS IN THE UNITED KINGDOM.

1. The only persons eligible for free passages will be single females, under the age of 35, who have been accustomed to domestic service, who can produce certificates of good characters satisfactory to Her Majesty's Emigration Commissioners, and are free from any mental or bodily infirmity.
2. Her Majesty's Emigration Commissioners should arrange for the selection and despatch of, as nearly as possible, 150 females per month.
3. The expenses of conveyance to the port of embarkation, as well as the cost of the passage, will be defrayed by the Government; each emigrant will, however, be required to pay ten shillings, in order that the Government may provide the necessary bedding and mess utensils.
4. In the event of Her Majesty's Emigration Commissioners being unable to provide the necessary number of married couples from passage-warrant holders on board vessels conveying single females under these regulations, to act as mess constables and otherwise protect such females, the Emigration Commissioners may select married couples, not exceeding ten for every hundred single females, who will be considered as eligible for free passages. Such persons will be received on arrival into the depôt on the usual conditions.

No. II.

REGULATIONS FOR THE NOMINATION OF EMIGRANTS IN VICTORIA.

1. Persons resident in Victoria, desirous of bringing their relatives and friends from the United Kingdom to Victoria, may apply to the officer named in Clause 3 for "Passage Warrants," which will be granted, under the conditions mentioned in these regulations.
2. The persons to be nominated shall be British subjects, of sound mind, in good health, and of good character, provided they are not excluded by Clause 14.
3. All applications shall be made in accordance with *Form A*, hereunto attached, which may be obtained at any *post-office* or police station throughout the colony, in addition to the offices mentioned in this clause. This form, with the necessary particulars carefully inserted, should be sent to the Immigration Agent, Melbourne, or to one of the following officers:—Geelong, Portland, Port Fairy, Warrnambool, and Port Albert, to the Assistant Immigration Agents; Ararat, Avoca, Barkly, Ballarat, Beechworth, Castlemaine, Creswick, Daylesford, Dunolly, Hamilton, Inglewood, Maryborough, Sandhurst, Stawell (Pleasant Creek), Smythesdale, Talbot (Back Creek), and Woodspoint, to the Receivers and Paymasters; Kilmore and Kyneton, to the Postmasters.
4. Upon receipt of this form, correctly filled up, the officer concerned will inform the applicant verbally, if present, or by Form B, if absent, of the amount required to be paid. So soon as the amount mentioned shall have been paid to the Assistant Immigration Agent, or Receiver and Paymaster, or Postmaster (as the case may be), the money, or a Treasury receipt for it, is to be sent to the Immigration Agent in Melbourne, with the application form (marked C). The Immigration Agent will then transmit passage warrants for the persons nominated, either to the office at which the money was paid, or to such address as the nominator may request. The passage warrant must be sent by the nominator to his friends in the United Kingdom.

APPENDIX E.—IMMIGRATION REGULATIONS.

5. The following sums shall be in all instances paid by the nominator in advance, in respect to intending emigrants of the various classes, prior to the issue of the passage warrants:—

Sex.	Under Fifteen Years.	Fifteen Years and under Forty.	Forty Years and Upwards.
	£	£	£
Male......................	2	5	8
Female....................	1	2	5

6. The passage warrant will entitle the person or persons named therein, except unprotected single females, in accordance with Clause 13 of these regulations, to be conveyed to Melbourne from the port mentioned in such warrant, *by a ship to be named by the contractors within one month of the receipt by them (the contractors) of a request for a passage in terms of such warrant;* but unless a nominee shall leave the United Kingdom within nine months from the date of his warrant, such warrant will not be recognised.

7. Warrants will be payable in the following manner:—One moiety payable in England upon Her Majesty's Emigration Commissioners being satisfied that the immigrants named therein have departed; the remaining moiety within ten days after the arrival of the immigrants, provided that the conditions of the contract have been in all respects faithfully performed, and a schedule of the warrants certified by the Immigration Agent accordingly.

8. Masters of ships arriving in this colony with immigrants introduced under these regulations, shall furnish to the Immigration Officer boarding a list, showing the number and names of such immigrants, who shall then be produced with their warrants by the master, for identification; and if found to correspond with the description upon the warrant, such warrant shall be endorsed by the said Immigration Officer.

9. Passage warrants shall not be issued for children under fifteen years of age, unless on an undertaking that they shall be accompanied by some suitable person who will take charge of them during the voyage.

10. No person should, upon any account, send any money to any officer specified in clause 3, unless he shall previously have received Form B, directing him to do so.

11. Should the person specified in the passage warrant decline or be unable to emigrate, the money paid towards their passages will not be refunded to the nominator, but, unless the nominator requires the passage warrant to be made non-transferable, the nominee, having first obtained the consent of Her Majesty's Emigration Commissioners, may by endorsement transfer such warrant. Should the nominee be dead, or a warrant returned not availed of, such passage warrant may be exchanged upon application to the Immigration Agent in Melbourne.

12. If the nominator wilfully misrepresent particulars or neglect to furnish full information respecting the persons nominated, or if the transferror wilfully misrepresents particulars, or neglects to furnish full information respecting the person to whom he proposes to transfer the passage warrant, or if any person known by the nominator to be under indenture, or any person disqualified by these regulations, be nominated, then the Commissioner of Trade and Customs, or Her Majesty's Emigration Commissioners, may cancel the said passage warrant, and the deposit shall be forfeited; or if the nominee or transferree may have been introduced into Victoria previous to the disqualification being discovered, the nominator shall be held liable to refund the amount paid by the Government in respect to such passage warrant.

13. No single females will be permitted to be conveyed in any ships except in accordance with the Queen's Order in Council, dated 3rd February, 1863, unless accompanied by relatives or a family of friends.

14. No passage warrant shall be issued, and no transfer of any warrant will be permitted, in favour of or to any person who has already been in Victoria, or who may be either lunatic, idiotic, deaf, dumb, blind, or infirm.

APPENDIX E.—IMMIGRATION REGULATIONS.

15. No immigrant will be received into the Immigration Depôt except those introduced entirely at the public expense, and single females, who may be maintained during seven days at the expense of the contractors, and any subsequent period at that of the nominator, unless they hire for domestic service. All nominators, therefore, are strictly enjoined to make provision for the reception of their nominees immediately on their arrival, as they, except the single females, will not be allowed to remain on board ship for more than seven days after the date thereof.

No. FORM A. 186 .

SIR—I have the honour to transmit a list of the persons I wish to bring into this colony from the United Kingdom. The full particulars, as given in the form below, are, to the best of my knowledge and belief, true in every respect. I should, therefore, feel obliged by your informing me of the sum to be paid in accordance with the existing regulations, by which, in consideration of passage warrants being granted to me, I undertake in all respects strictly to abide and be bound.

Christian Name and Surname at full length.	Age.	Whether Married or Single.	Relationship to Depositor	Trade or Calling of Nominee	Address at full length of the Place or Town and Street where living in the United Kingdom.	Has the Nominee been previously in Victoria.	Country where Born.	Port at which it is desired that Nominees should embark.

I have the honour to be, Sir, your obedient servant,

Applicant's { Signature
Residence

To the Immigration Agent, Melbourne.

No. FORM B.

Immigration Office, Melbourne, 186 .

In reply to your inquiry as to the expense of securing passages from the United Kingdom to Victoria for the persons named in the Application Form, I have to inform you that the sum required will amount to £ , as stated in the margin, in accordance with the rates mentioned in the following scale:—

SEX.	Under Fifteen Years.	Fifteen Years and under Forty.	Forty Years and Upwards.
	£	£	£
Male....................	2	5	8
Female..................	1	2	5

On payment of the above sum at the Immigration Office, King-street, Melbourne, or at the office of the Receiver and Paymaster at passage warrant will be sent to you, which you will be careful to forward to the address of the nominee in the United Kingdom, specially inviting attention to the direction on the back thereof.

I am, your obedient servant,
Immigration Agent.

APPENDIX E.—IMMIGRATION REGULATIONS.

FORM C.

SIR—I have the honour to enclose an application from
for the passages of the persons named therein.

The sum of £ , as specified in the margin, has been paid into this office, and I enclose herewith a for the amount.

3. Mr. requests that the usual passage warrant may be sent for him to this office.

I have the honour to be, Sir, your most obedient servant.

The Immigration Agent, Melbourne.

No. III.

REGULATIONS FOR THE INTRODUCTION OF PERSONS SKILLED IN SPECIAL INDUSTRIES.

Passage certificates, entitling to a passage from Liverpool or London, will be issued to residents in Victoria, for the introduction of persons with their families (if married) "skilled in the production of wine or oil, and in the drying or preservation of fruit, &c.," upon the following conditions:—

Application to be made in writing to the Immigration Agent, specifying the number and description of persons proposed for introduction, the place from whence they are to be selected, the kind of business in which they are skilled, naming the applicant's agent; a bond with one surety, in the form annexed, must be executed, and payment of a similar deposit as is required in respect to nominations under Regulation No. II. must be made.

No application will, however, be entertained except on the special approval of the Commissioner of Trade and Customs.

FORM OF BOND.

Know all men by these presents: That we
are jointly and severally held and firmly bound unto Victoria, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, and so forth, in the sum of pounds, to be paid to the Queen aforesaid, her heirs or successors, for which payment well and truly to be made we bind ourselves and each of us, jointly and severally, our and each of our heirs, executors, and administrators, and every of them, firmly by these presents, sealed with our seals.

Dated this day of in the year of our Lord one thousand eight hundred and sixty-

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Whereas the above-bounden ha by letter dated made application to the Immigration Agent, at Melbourne, for passage certificates in favour of certain persons to be brought to Victoria, pursuant to the Regulations at present in force for the introduction of skilled labourers from the continent of Europe into Victoria:

Now the condition of the above-written obligation is such, that if the persons specified as aforesaid shall be forwarded to Victoria, and if they shall be provided with certificates from the magisterial authority of the place or district from which they were selected, or other person duly authorised in that respect, to the effect that they are skilled in the description of labour specified, and free from any mental or bodily defect, and of good character, and if the said shall reimburse the Government of Victoria the cost of the conveyance of the said immigrants in the event of their being declared by the Board of Immigration Commissioners in Melbourne, on arrival, to be disqualified, then the above obligation to be void, or else to remain and be in full force and virtue.

Sealed and delivered by the above-named

in the presence of

APPENDIX F.

*** *The following tables have been extracted from the Report of the Royal Commission on Public Education in Victoria, dated Jan.* 29, 1867.

TABLE I.—PUBLIC AND PRIVATE SCHOOLS.

RETURN showing, for a series of years, the estimated Mean Population of Victoria, and the Number of Schools, Scholars, and Teachers, with their respective Proportions to the Population.

Years.	Estimated Mean Population, including Aborigines and Chinese.	Schools.			Scholars.			Teachers.		
		Number.	Proportion to Mean Population.		Number.	Proportion to Mean Population.		Number.	Proportion to Mean Population.	
			Per-centage	Or One School to		Per-centage.	Or One Scholar to		Per centage.	Or One Teacher to
1839	5,201	4	·08	1300·25	250	4·81	20·80	...	...	...
1840	8,056	11	·14	732·36	625	7·76	12·90	...	...	...
1841	15,353	20	·13	767·65	691	4·50	22·22	...	...	...
1850	71,191	160	·22	444·94	6,807	9·56	10·46	...	...	...
1851	86,825	129	·15	673·06	7,060	8·13	12·30	...	...	...
1852	132,905	115	·09	1155 69	7,841	5·90	16·95	...	...	...
1853	195,378	206	·11	948·44	13,033	6 67	14·99	...	...	...
1854	267,371	391	·15	683 81	20,107	7·52	13·30	...	...	...
1855	338,315	438	·13	772·41	24,478	7 24	13·82	...	...	...
1856	380,942	455	·12	837·24	26,323	6·91	14·47	...	...	...
1857	430,347	675	·16	637·55	36,671	8·52	11·74	...	...	...
1858	483,827	740	·15	653·82	42,432	8·77	11·40	...	...	...
1859	517,226	772	·15	669·98	46,265	8·94	11·18	...	...	...
1860	539,337	886	·16	608·73	51,668	9·58	10·44	...	...	...
1861	541,012	882	·16	613·39	56,473	10·44	9·58	...	...	...
1862	548,450	989	·18	554·55	65,541	11·95	8·37	...	...	...
1863	561,322	1019	·18	550·86	69,619	12·40	8·06	2068	·37	272·09
1864	589,160	947	·16	622·13	66,145	11·23	8 91	1988	·34	296·35
1865	616,375	1056	·17	583·69	76,304	12·38	8·08	2284	·37	269·86
1866	632,998	1080	·17	586·11	79,378	12·54	7·97	2130	·34	297·18

WILLIAM HENRY ARCHER,
Registrar-General.

Melbourne, 27th September, 1866.

TABLE II.—PUBLIC AND PRIVATE SCHOOLS.

VICTORIA.—Proportion of Scholars to the Population at School Ages, 1854-66.

YEARS.	Number of Scholars at all Ages.	POPULATION.*		PROPORTION OF SCHOLARS TO THE POPULATION.			
				Over 3 years of age.		Over 5 years of age.	
		Over 3 and under 15.	Over 5 and under 15.	Per-centage.	Or 1 scholar in	Per-centage.	Or 1 scholar in
1854	20,107	47,238	36,949	42·57	2·35	54·42	1·84
1857	36,671	74,726	58,041	49·07	2·04	63·18	1·58
1861	56,473	121,661	87,806	46·42	2·15	64·32	1·55
1865 (31st December)	76,304	154,305	116,826	49·45	2·02	65·31	1·53
1866 (31st March)	79,378†	170,225	133,487	46·63	2·14	59·47	1 68

WILLIAM HENRY ARCHER,
Registrar-General.

Melbourne, 27th September, 1866.

* The number of children in 1854, 1857, and 1861 were returned by the census which was taken in each of those years. The number given for the end of 1865 and the first quarter of 1866 have been estimated upon reliable data.

† Of the 79,378 scholars in 1866, there were 11,378 ascertained to be in private schools. The remainder (68,000) is lower than the number now on the roll in the third quarter of the year.

APPENDIX F.

Table III.—Public and Private Schools.

Return showing the estimated Population at the end of the First Quarter of 1866, at each year of age from 3 and under 16, the Number of Scholars at the same ages, and the Proportion of Scholars to the Population.

Age.	Estimated Population, 1866.	Number of Scholars, 1866.	Proportion of Scholars to Population.	
			Percentage.	Or 1 to
3 to 7	70,224	27,920	39·76	2·52
7 „ 8	17,278	7,024	40·66	2·46
8 „ 9	16,554	10,256	61·95	1·61
9 „ 10	15,733	9,912	63·00	1·59
10 „ 11	14,058	8,472	60·23	1·66
11 „ 12	12,187	6,376	52·32	1·91
12 „ 13	9,881	4,240	42·91	2·33
13 „ 14	7,788	2,776	35·46	2·81
14 „ 15	7,470	1,696	22·70	4·40
15 „ 16	7,873	1,328	16·87	5·93
Total	179,040	80,000*	44·[illegible]	2·24

WILLIAM HENRY ARCHER,
Registrar-General.

Melbourne, 27th September, 1866.

VICTORIA.

Population at the end of 1865	626,639
Average attendance of scholars in Common Schools, 1866	51,500

	£	s.	d.
Vote for education, 1866	£174,247	0	[illegible]
Amount voted for education per head of the population	0	5	6¼
Amount voted for education per scholar in average attendance	3	7	8

GREAT BRITAIN.

Population, 1865	24,418,617
Average attendance of scholars in Privy Council Schools, about	1,133,000

	£	s.	d.
Vote for education, about	£750,000	0	0
Amount voted for education per head of the population	0	0	7½
Amount voted for education per scholar in average attendance	0	13	2¾
Amount required in Great Britain, if the same amount per head of population were spent as in Victoria	6,789,959	0	0
Amount required in Great Britain if the same amount per scholar were spent in Great Britain as in Victoria	8,883,434	0	0

WILLIAM HENRY ARCHER,
Registrar-General.

Melbourne, 27th September, 1866.

N.B.—The figures relating to Great Britain are but approximations, based on the best information available at the time of giving my evidence before the Royal Commission.

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* The number of children actually ascertained was 79,378, as shown in the previous table.

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APPENDICES.

ERRATA.

Page 5.—Table II., heading to last column, *read* "0·1," *instead of* "1·0."

Page 21.—Heading to Table XV., *read* "1836-1865," *instead of* "1835-65."

Page 30.—Heading to Table XXV., *read* "1853-1861," *instead of* "1853-1865."

Page 39.—Heading to Table XXXV., *read* "1857-1866," *instead of* "1857-1861."

Page 51.—Paragraph 227, first line, *read* "1837," *instead of* "1839."

BLUNDELL AND CO., PRINTERS, FLINDERS LANE WEST, MELBOURNE.

INTERCOLONIAL EXHIBITION ESSAYS, 1866-67.

No. 2.

MINING AND MINERAL STATISTICS.

BY R. BROUGH SMYTH, F.G.S. LONDON;

HONORARY CORRESPONDING MEMBER OF THE SOCIETY OF ARTS AND SCIENCES OF UTRECHT;

SECRETARY OF MINES FOR THE COLONY OF VICTORIA;

ETC., ETC.

MINING AND MINERAL STATISTICS.

IN the prefatory Essay on Mining in the Colony of Victoria, which was published with the Catalogue of the Victorian Exhibition in 1861, it was stated that the labours of the miners were confined almost exclusively to the working of, and the extraction of gold from, the auriferous rocks. It was observed that the extraordinary richness of the goldfields, absorbing nearly all the available labour in the country, had to some extent prevented the exploration of the deposits of tin, antimony, iron ore, and coal; and a hope was expressed that in a short time other minerals and metals as well as gold would attract the attention of the capitalist, and that new fields would be explored and fresh sources of industry opened up to the intelligent miner, which would afford employment to a great number of persons. This hope has not been disappointed. Whilst the yield of gold per annum has not fallen off, if we make proper allowance for the reduction in the number of miners, other minerals have been eagerly sought for, and large areas of country have been prospected, and in some parts thoroughly explored.

From St. Arnaud we have obtained silver; from Beechworth and the heads of the Latrobe, fresh supplies of tin; from the River Thomson, in Gipps Land, copper; from Heathcote, large quantities of antimony; from Cape Paterson, coal; from Lal Lal, near Ballarat, lignite; from Omeo, bismuth; from Yackandandah, molybdenite; from Pleasant Creek, the Upper Yarra, and other localities, manganese; from Bulla and Dunolly, clays suitable for the manufacture of the finer kinds of porcelain; from Castlemaine, magnesite; from Maldon, Castlemaine, and Meredith, roofing slates; and from Beechworth, diamonds.

If all these are not fully represented in the tables, it is not less certain that they occur; and that in due time they will add greatly to the wealth of the country. Gold mining, however, continues to be profitable; and it is not probable that experienced miners will forsake the search for gold, in order to engage in other mining operations which do not offer sure prospects of success, so long as rich quartz reefs and auriferous alluvions lie neglected.

The following estimate of the value of the metals and minerals raised in the colony, from the first discovery of the goldfields to the 31st December, 1865, has been compiled with care :—

GOLD	Quantity raised from the date of the first discovery to the 31st December, 1865, 30,998,071 ozs., @ £4 per oz.		£123,992,284
SILVER	Ore raised, 5880 tons. Produce of Silver from Ore smelted, 10,165 1-5th ozs., @ 5s. 6d. per oz.		2,795
TIN	Ore exported, 2380¾ tons, @ £75 per ton,	£178,556	
	Tin exported—say 3 tons 12 cwt. 3 qrs. 12 lbs., @ £140 per ton	510	
			179,066
ANTIMONY	Ore raised, 2114 tons and 26 lbs., at £12 per ton		25,368
COAL	1933 tons, @ £1 10s. per ton		2,899
LIGNITE	235 tons, @ 17s. 6d. per ton		205
KAOLIN	1757 tons, @ £4 per ton		7,028
FLAGGING	1500 square yards, @ 8s. per square yard		600
SLATES	1000 No., @ £8 per 1000	£8	
	43 tons, @ £4 per ton	172	
			180
DIAMONDS	About 79 carats, @ £1 per carat		79
SAPPHIRES	Numbers cannot be estimated—say		150
	Total		£124,210,654

NOTE.—No estimate has been formed of the quantities of gold which have been sent out of the colony privately, nor of the quantity used and manufactured in the colony.

The prices of the several ores, &c., have been obtained from persons best acquainted with the market value of them.

MINERAL DISTRICTS.

It is necessary to a proper understanding of the mineral resources of the colony to give some account of the areas occupied by the more important rock formations. It is, unfortunately, impossible to give accurate data; but a statement sufficiently near the truth for practical purposes has been carefully compiled from a manuscript sketch map. Rough measurements give the following results :—

	Square miles.
1. Granites and other plutonic rocks, 2500 to	3,000
2. Sandstones, claystones, and slates belonging to the Lower Devonian and Upper and Lower Silurian ages	25,000
3. Carboniferous rocks, including schists likely to yield petroleum and rock oils	3,000
4. Basaltic and volcanic rocks	10,000
5. Tertiary rocks, including the Murray tertiaries and those occurring on the seaboard	28,000
6. Country of which but little is known at present relative to the rock formations	17,831
	86,831

The total 86,831 square miles is the area of the colony. One-third of the total area may safely be considered as occupied by gold-bearing rocks. In all places, the schists and claystones, with the intersecting veins of quartz, are not exposed to view; they are covered with thin strata of alluvions and tertiaries; but, having penetrated these, we come at once on the old bed rocks.

But a small portion of this vast area has been properly explored. There are 18,523,947 acres open to the miner, over nearly every part of which occur auriferous quartz veins and auriferous alluvions; but at the end of the year 1865 only 464,000 acres, or little more than one fiftieth of the

whole, had been opened up. The areas actually occupied by the miners for mining purposes, in December, 1865, were as follow :—

	A.	R.	P.
Held and worked "claims" under the bye-laws of the Mining Boards	79,025	2	32
Protected by certificates, &c.	39,731	2	15
Leases for years—1043 for	15,779	1	17
Total	134,536	2	24

Gold is found to occur not only in the quartz veins and the alluvial deposits derived from these and the surrounding rocks, but also in the claystone itself (specimens are exhibited); and, contrary to expectation, flat bands of auriferous quartz have been discovered in dykes of diorite, which intersect the Upper Silurian or Lower Devonian rocks. Quartz of quite extraordinary richness has been obtained from these bands, and the new experience of the miner is leading him to look for gold in places heretofore neglected. It is probable that some time may be lost, and that his labours may not always be well directed or successful; but it is commendable that he should not be deterred from exploration by warnings and remonstrances founded on surmises often baseless. If he had closely followed the older precepts, we should at this moment have been dependent for our yield of gold on the shallower alluvions and the surface only of the veins of quartz. The miner is, however, prospecting the deeper tertiaries, with well-grounded hopes of success; and some of the shafts which have been sunk to penetrate the veins are as deep as 590 feet.* From these levels very rich quartz has been obtained.

The approximate area occupied by granites and other plutonic rocks, it has been stated, is 3000 square miles. Patches of irregular form appear in numerous places, but mostly within the boundaries of the older schists. These and the schists have been greatly denuded. In some places the granite is decomposed *in situ*, and from such spots we get kaolin. In other parts veins of granite, projected from the larger masses, intersect metamorphosed slate and quartz, and the auriferous quartz veins and the granite are so intimately associated that the granite itself is quarried out and sent to the mills to be crushed. It is not strictly correct, perhaps, to say that gold is found in the granite, but some specimens are so rich in gold, while the thin veins of quartz are so small and insignificant, that without careful examination it would not be easy to determine the mode of occurrence of the gold. At Nuggety Reef, near Maldon, the granite abuts on the slates and claystones, and the larger quartz veins are cut off abruptly at the junction. Where the granite is decomposed, it is easy to shovel away the loose clay and expose the end of the vein. Pyrrhotine and other forms of iron pyrites are found in these veins, and at every step one sees proofs of the crystallogenic forces which have been exerted here during long periods, and are probably, at some depth below the surface, as energetic now as at any other time.

The appearance of a granite country is pleasing. Masses of projecting and weathered rock on one side of the hill, and fine, smooth, well-grassed slopes on the other, with just sufficient timber to give the whole the

* Specimens of quartz from this depth yielding 2 ozs. of gold per ton, are exhibited.

appearance of a well-kept park, and here and there a stream of pure water flowing over large masses of smooth rock, present pictures which are rudely broken by the ugly poppet-heads, the weatherboard engine-house, and the hard outlines of the brick chimney, which form the establishment of the more prosperous miner.

The sandstones, claystones, and slates belonging to the lower palæozoic age appear on the map as a great band some fifty or sixty miles in width, stretching across the colony from east to west, and situate mostly between the parallels of 36 deg. 30 min. and 37 deg. 30 min. The outline is ragged, and islands of schist rise out of the basalts and tertiaries, both on the north and on the south; and if the basalts and tertiaries were removed, more than seven-eighths of the surface of the colony would be occupied by rocks of the lower palæozoic age. Over the whole of the area we find veins of quartz, and it is not possible to say that any one of them is not auriferous. Goldfields, such as Castlemaine and Sandhurst, which are situate in basins in the schists and sandstones, were once thickly-timbered forests. The alluvions rest immediately on the older rocks. Steep, narrow ridges run almost at right angles to higher and more precipitous ranges of hills; the watercourses, nearly parallel to each other, trend from the sides to the middle of the basin; and the uniformity of the hills, and their sharp outlines, give harshness to the landscape, which is not improved by the character of the timber. At the sources of the Goulburn and the Thomson the country is wild and broken, the hills are lofty and very steep, and for many weeks during the winter they are covered with snow. At Ballarat we find on the east side of the creek a low range of hills composed of the older rocks, with numerous thick veins of quartz, and on the west a basaltic table-land. The valleys trending westward from the palæozoic hills were first opened up by the miner. Here he found moderately-deep alluvions, which were rich in gold; and, following their trend, they carried him under the basalt, and finally developed the richest gold workings, perhaps, in the world. The basalt itself has been denuded, but not towards the west to a depth sufficient to cut the tertiary deposits; and the miner consequently has to explore the surface of the older sedimentary rocks without help from surface indications. He does not know the course of the gutter, the trend of the tributaries, nor the situation of the low-lying flats, where are concealed rich deposits of auriferous earth. He sinks a shaft 300 or 400 feet in depth, and thence makes explorations, guided sometimes by the trend of the ancient surface, until the *gutter* is struck.

Some twenty miles north of Ballarat the denuding forces have operated energetically. Near Daylesford the modern streams have scooped out valleys clean through basalt, tertiary, and schist. The existing watercourses are in some places sixty feet below the level of the beds of the old streams, and high and almost perpendicular cliffs of great height, rugged and yet very beautiful, meet the eye at every turn of the road. The *leads* or *gutters* in this locality are penetrated by tunnels. On the side of a high cliff, and at a point some sixty or seventy feet above the bed of the existing watercourse, the miner finds a shelf on which, by building walls, he can make room for a puddling machine and a hut. Here he drives a tunnel, 1000 or 1500 feet in length, to reach the auriferous earth. The vertical section overhead is palæozoic sandstones and shales, capped by basalt, and until he penetrates far into the hill he does not touch the

auriferous drift.* But it is there; and it is somewhat remarkable that the bed of the old stream everywhere runs nearly parallel to the modern water-course. When the latter cuts the old *lead*, as in some places it does, the recent drift is rich in gold—derived partly from the wearing and waste of exposed quartz reefs and partly from the old alluvions. Fossil wood, lignite, and mud shales, with fossil leaves, are abundant in the old leads at

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* The following extract from the *Geology of California*, 1865, by J. D. Whitney, State Geologist, is descriptive of the tunnelling operations under lava, on the western slope of the Sierra Nevada. Speaking of the country in the vicinity of the Table Mountain of Tuolumne County, he says:—

"The table mountain of Tuolumne County is a flow of lava originating in the lofty volcanic region beyond the Big Trees of Calaveras; . . . it comes down on the north side of the Stanislaus, forming a nearly-continuous ridge, elevated more than 2000 feet above the river. . . . As seen from a distance, this Table Mountain reveals its origin at once in the contrast between the long straight line of its upper edge and the broken and curving ones which the eroded hills of the auriferous slates everywhere exhibit. . . . . . On approaching Table Mountain, and examining the material of which it is composed and the position which it occupies, it is seen at once that it is a vast lava flow, of which the upper surface remains very nearly at the level and with the form which it originally had at the time of its consolidation, while its edges and the surrounding country have been denuded and washed away, so that the topography of the region is entirely different from what it once was; in fact, it is almost the reverse of it. . . . . There must have been an amount of denudation during the period since this volcanic mass took its present position of not less than three or four thousand feet of perpendicular depth, and yet this was all done during the most recent geological epoch. . . .

"Underneath the lava is a heavy deposit of a detrital material, very distinctly stratified, and lying nearly horizontal or with a slight dip each way towards the centre of the mass. These sedimentary beds are of variable characters, but are chiefly made up of a rather fine-grained sandstone, not very closely compacted, and which rapidly disintegrates on exposure. Interstratified with this sandstone, and especially near the bottom of the deposit, are fine argillaceous shales and clays, nearly white and often beautifully laminated. With these are beds of gravelly materials, strongly cohering together, and called 'cement' by the miners, and at the bottom the 'pay-gravel' or the 'channel,' a body of coarse gravel, exactly like that seen in the bed of an ordinary river. The entire thickness of the detrital beds, directly under the centre of the lava, is, in one locality at least, fully 200 feet. . . . The auriferous gravel in the channel is from four to five feet thick. It will give some idea of the cost and time for opening a deposit of this kind when it is stated that this tunnel was commenced in October, 1855, and that the pay-gravel was not struck until March, 1860, the cost of the work up to that time having been about 38,000 dols.

"The stratified materials under the lava are frequently found to contain masses of wood, and even entire trunks of trees. These are very commonly found under Table Mountain, although not as abundant here as in some of the hydraulic washings in other parts of the State. . . . . In the layers of finer sediment, called 'pipe-clay' by the miners, which are very thinly and evenly bedded and made up of the finest particles of clay, impressions of leaves are occasionally found. Neither the wood nor the leaves from this and similar localities have as yet been minutely examined.

"A few specimens of the leaves from the Buckeye Tunnel were forwarded to Dr. Newberry, who made a preliminary investigation of them, and furnished us with some notes of his results, from which we are authorised to draw the conclusion that these stratified deposits underneath the lava of Table Mountain are of tertiary age, and that in all probability they belong to the later pliocene epoch. Dr. Newberry remarks that the leaves submitted to him are quite different from those of any trees now growing in California, and that they are specifically distinct from those of the miocene tertiaries of Oregon, Nebraska, or any other part of the Continent. They include tertiary and recent genera, such as *Acer Carpinus*, and are, therefore, not older than the miocene. They most resemble the species found in the later European tertiaries."

Daylesford. At Castlemaine, still further to the north, the old leads are seen to occur only in patches; the basalt and tertiaries have been worn away, and what exist at Ballarat as old *leads*, 300 feet below the surface, stand out here as low rounded hills.

The carboniferous rocks occupy an area of about 3000 square miles, or 1,920,000 acres. They are found in Gipps Land, in the counties of Grant, Polwarth, Mornington, and Bourke, and in the Portland Bay district. Two large areas are well worth prospecting. One extends from Moonlight Head to Portarlington, and the other lies to the north and north-east of the line of coast between Griffith's Point and Anderson's Inlet.

As regards the first—the Cape Otway district—it is confidently asserted that seams of coal crop out at the surface at some distance from the coast; and it is certain that numerous seams of coal and bituminous shale are to be found between Cape Otway and Point Roadknight. Near Cape Paton there is a bed of bituminous shale which burnt for nearly twelve months. A large area sunk considerably, and ultimately a lake of bitter water was formed. The shale was ignited, it is said, when the country was on fire on Black Thursday (6th February, 1851). On the north the coal-bearing rocks are covered by basalt, but it is probable that they do not extend far in a northerly direction. On the west the older palæozoic rocks occur, and gold has been found in one or two places. The discovery of gold at this point, so far from the centres of mining industry, lends probability to the theory that the deeper *leads* will be found underneath the basalt close up to the boundary of the carboniferous rocks; and auriferous tertiaries may perhaps overlie these in some places. To find a bed-rock of mesozoic age and full of fossils might puzzle the miner, but the geologist would at once understand the relation of the rocks, and perceive how detritus from auriferous quartz veins could be carried away and deposited in valleys in the carboniferous formations. On the east—at Cape Paterson—the seams of coal vary in thickness from a few inches to 3 feet 9 inches. Several gentlemen interested in the development of our coalfields have energetically explored this tract of country, and well-grounded hopes are entertained that they will in a short time be able to supply Melbourne with coal. It is true that they have some difficulties before them, but none so great, it is said, as to be insurmountable. A large area of land is held under lease from the Crown; and, according to returns made by the lessees, it appears that 1933 tons of coal have been raised. The new Griffith's Point Coal Company have put down a bore to the depth of 830 feet, and they propose to increase the depth. Discoveries of thin seams in other parts of the colony are reported from time to time, and it will not be the fault of the miners and capitalists of this country if we are long dependent on a neighbouring colony for supplies of coal.

The surface of the country where the carboniferous rocks prevail is in some places rugged and harsh, with dense forests of large timber, and in other parts the hills are well rounded and the valleys wide. This formation has been largely denuded, and it is probable that it once occupied a very considerable area.

The basaltic country extends from the River Plenty on the east to Mount Gambier on the west. A great deal has been carried away; and if the schists and tertiaries had not in many places been denuded of their covering of basalt, some of our richest goldfields would have remained long undiscovered. The great western plains are occupied by basalt; the

country is low and level, and it is well grassed in many parts, but there is very little timber—one may travel for miles and see scarcely a bush. The lake district, on the south, is very beautiful. Crateriform hills and cones rise on every side; the foreground is rocky and rugged, and the light wood and tall shrubs give a fine colour to the landscape. Some of the lakes are fresh, and some brackish, or salt. From the latter a good deal of salt is obtained for home consumption.

This country would not be entitled to more than a few words of description if it were not of the highest interest to the miner. Already the gold-workings have extended to a point not far north of Lake Korangamite (the centre of a great depression in the basaltic country, forming an independent system of drainage), and persons are now continually asking why the great plains are not explored. Many believe that we shall find deep leads and the same under-surface as at Ballarat; and when the small cost of putting down bores is considered, it is indeed remarkable that so little has yet been done. It is due, no doubt, to the fact that we are richer in energy than in unemployed capital. The miner, with a bundle of blankets and a very small supply of provisions, will fearlessly explore the lofty ranges in Gipps Land, and tear his way through thick scrub, half blinded with sleet and snow, in search of new goldfields; but the capitalist naturally hesitates to venture his money in an uncertain speculation when many profitable avenues are open to him.

The area occupied by tertiary rocks—28,000 square miles—does not include the thin alluvions in valleys and creeks within the boundaries of the palæozoic strata, nor the basalts of this age. A large extent of country, lying between the northern boundary of the old sedimentary rocks and the River Murray, is occupied by tertiaries, which are in all probability auriferous throughout; but whether everywhere containing gold in such quantities and so distributed as to admit of being profitably worked, is not certain. It is said that north of St. Arnaud they are being explored, and that a considerable quantity of gold has been obtained from a thick bed of auriferous gravel.

In Gipps Land a large area west of Lake Wellington is covered with tertiary strata, but they have not yet been properly explored.

In the Murray basin, towards the north-west, the tertiaries are covered with recent sand, and in some parts with powdered sulphate of lime. The country is uninviting; and the dense scrub, and the absence of fresh water, greatly hinder exploration.

It is within this area that we may hope to find beds of salt, sulphate of lime, and deposits of lignite.

The unexplored country, respecting which nothing certain is known of the rock formation, is very large. The highlands at the sources of the Murray, and a considerable area east of the Snowy River, are almost unknown to the miner. They lie far from towns. The cost of exploration, and not the hazard or difficulties, deters men from seeking in these remote localities new fields; but the occupation of the adjacent country will shortly afford facilities for prospecting which do not now exist, and it is probable that we shall soon know something of the physical character and the resources of these parts of the colony.

But a short time ago the country at the sources of the River Goulburn and the River Thomson, and all along the Great Dividing Range as far as the River Tambo, was utterly unknown to the gold miners; and now it is

inhabited by great numbers, who have built towns, made roads and streets, and erected valuable machinery for reducing quartz, in ravines and on plateaux which by men with less energy would have been considered unapproachable.

GOLD.

DISCOVERY OF GOLD IN VICTORIA.

It is said that gold was found in the Pyrenees by a shepherd in 1849, but long before this it was known to the settlers that gold was to be obtained, for their servants collected it and sold it. Little attention was given to the matter. Men's minds were directed, in the early days of the colony, to the finding of good sheep and cattle country; they knew nothing of goldfields; and the discovery from time to time of small pieces of gold was not enough to induce them to turn from their own pursuits. But for the miners of California we should have remained ignorant of our wealth. The discoveries in that part of America turned the attention of practical men to the search for gold in New South Wales and Victoria, and profitable fields were very soon developed. Gold was found at Clunes, it is said, in March, 1850; on the 10th June, 1851, it was discovered near Burnt Bank, on a tributary of the River Loddon; on the 20th July, at Mount Alexander; on the 8th August, at Buninyong; and on the 8th September, in the same year, at Ballarat. The conflicting claims of discoverers render it very difficult to fix the dates with any degree of accuracy.

Licenses to dig were first issued on the 1st September, 1851, and such great yields were reported that the colonists very soon left their ordinary occupations for the exciting work of searching for gold. In 1851 the total male population of the colony was only 46,202, and the sudden withdrawal from their usual pursuits of nearly half of these produced a change in the social condition of the country which eye-witnesses describe as wonderful. Lawyers forsook the courts, merchants the counting-houses, clerks their desks, and artisans and labourers fled precipitately from houses but half built and foundations but partly dug. Even clergymen were drawn to the exciting scene, and not in every case did they confine themselves to their calling. The price of labour increased enormously, provisions of all kinds rose to unprecedented prices, property in Melbourne was seriously depreciated, and it was only after the great and sudden influx of immigrants from Europe and the neighbouring colonies that society regained in some measure its normal state.

In works on physical geography, and geology, published in England, frequent reference is made to the goldfields of Victoria. The writers assume that gold occurs in shallow alluviums, that these are all but exhausted, and that the colonists generally are now engaged in farming, in trade, and in manufactures. They say that the rich deposits served to induce persons to emigrate, and now that the colony is peopled, the good end has been accomplished and the gold will soon disappear altogether. The tables appended to this paper, and the descriptions of our mines, will serve to convince those who hold such a belief that they are wrong. Our goldfields are practically inexhaustible. Our deep auriferous tertiaries and our quartz veins are not half prospected; and day after day fresh discoveries of auriferous alluvions are made. We have room for four

times the number of persons now actually engaged in mining; and if the yield of gold has fallen off, it is because the numbers engaged in mining have decreased. Gold mining is laborious, often uncertain, and frequently involves hardships and suffering which none but the strongest are capable of bearing without injury; and it is not surprising that many persons who left their professions and trades in the hope that they would rapidly acquire a fortune on the goldfields have resumed their former pursuits.

AURIFEROUS QUARTZ VEINS.

Numerous quartz veins are found in all those parts of the colony where the schist rocks appear at the surface; and they are met with also cutting the older sedimentary rocks, under the tertiaries. The strata in which they occur present generally a low degree of metamorphism, and in many places are unaltered. The veins vary in thickness from an eighth of an inch to fifty feet; and some, almost as thin as the paper on which these words are printed, intersect rocks containing palæozoic fossils, and in such a manner as almost to cut the fossils, but the delicate structure of the casts is not altered, nor are any of the inter-spaces filled with quartz.

If we collect the magnetic bearings of all the known auriferous reefs, we find that the northerly and southerly veins, with rare exceptions, follow the strike of the rocks which they intersect, and are confined within the lines of oscillation of the magnetic declination. The easterly and westerly veins seem to conform to the same law. This is true of the quartz veins intersecting the palæozoic rocks; but there are auriferous quartz veins in granite, where this rock abuts on metamorphosed slate, which appear to be of more recent formation; and lately veins of quite remarkable richness have been discovered lying as flat and nearly parallel bands in dykes of syenitic diorite.*

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* The following extract from a report on the gold workings in these dykes, by C. D'Oyly H. Aplin, Esq., Acting Director of the Geological Survey, will be read with interest. The report is dated 26th January, 1864:—

"On this spur, at Wood's Point, at a short distance above and overlooking the township, is the celebrated 'Morning Star Reef,' from which for months past returns appearing to be almost fabulous in amount have been derived.

"This so-called 'reef,' but to which the term is manifestly inapplicable, includes a series of three, and possibly more, horizontal and approximately-parallel veins of auriferous quartz, traversing a dyke of syenite about 100 yards broad at the surface, and widening downwards. The direction of this dyke is about N. 55 deg. W., the general direction or strike of the sandstones and slates of the district N. 45 deg. W. (magnetic). Their dip, as seen at the eastern wall of the dyke, is about 80 deg. to the west; the general dip of the beds, wherever I could see sections, being at very high angles from 75 deg. to vertical.

"The rock constituting the dyke is a mixture of hornblende and felspar, with but little quartz, and occasionally mica; it might, perhaps, be more correctly termed a *syenitic diorite*. From the surface downwards, as deep as the workings extend, it is in a decomposed state, and no great difficulty is experienced in sinking or driving in it. A good deal of slabbing, however, is required for both. In the lowest tunnel (Hurley and Co.'s), this rock where first struck, and for about fifty or sixty feet beyond, is found to be very hard, and in an almost unaltered condition; this is the case also with large boulders that are found loose in the soil on the flank of the spur. The soil derived from its decomposition is of a very rich character, and vegetables of all kinds are said to grow luxuriantly in it.

"Crossing this dyke at different levels, some sixty or seventy feet apart, are three horizontal bands or veins of quartz, each of which is at present being worked by different parties, whose claims are all registered as being on the same reef—the

The surface of the colony, it has been stated, has been but imperfectly explored; and it is probable that gold will be found here, as in America, in places where, if the old theories relative to the modes of occurrence of gold were correct, it ought not to exist.

Many theories have been advanced relative to the mode in which veins have been impregnated with gold. An eminent geologist, Sir R. I.

Morning Star. This may hereafter give rise to some difficulty in the application of the mining by-laws, should they ever require to be appealed to in case of dispute.

. . . .

"The quartz veins, though horizontally traversing the dyke, are more or less undulating in their course. They vary in thickness in different parts of the workings from one or two feet to as much as twelve, but in the latter case are split up into a mass of thin ramifying and reticulating veins, enclosing between and amongst them portions of the syenitic mass through which they have penetrated. The whole thickness, however, is sent to the mill to be crushed. They abound in crystals of quartz, many of them very perfect in form and beautifully grouped together. Iron pyrites is also abundant, and in Drysdale and Co.'s claim sulphide of antimony had been met with. In tracing the extension of the veins they are working into the adjacent schist rocks.

"As the quartz veins approach the walls of the dyke, they seem to have a tendency to split up and become attenuated; they can, nevertheless, be seen passing obliquely downwards into the slates, but, except in Drysdale and Co.'s claim, do not appear to have been followed further. In Hurley and Co.'s claim I noticed, however, that the quartz, in a solid mass two feet thick, continued its course horizontally, cutting directly across the slates, but had only been followed as yet about three or four feet into them. Mr. Hurley informed me that at this spot the character of the quartz was rather improved than otherwise, and in Drysdale and Co.'s claim the quartz traversing the slates, though much attenuated in thickness, was exceedingly rich in quality.

. . . .

"The richness of the quartz may be judged of from the fact communicated to me by Mr. Colin M'Dougall (a partner in one of the claims on which machinery is erected and in the prospecting claim), that from quartz crushed since June last in a small machine of eight stamps, and driven by water power, a return of between £40,000 and £50,000 has been realised; 1200 ozs. was the return from the same machine for the week preceding my visit, and 1272 ozs. for the week following. In Drysdale and Co.'s, M'Dermott and Co.'s, and the Hope Company's claims, all situated adjacent to each other on the before-mentioned dyke, the quartz has proved to be exceedingly rich, but M'Dougall and Hurley are the only parties who have crushing machinery erected and at work; their claims, therefore, are the only ones that may be said, at present, to be producing returns.

"About two and a half miles from Wood's Point, along the spur dividing the left-hand branch of the Goulburn from some small tributaries of the right-hand branch, a new reef, called the Waverley, had been discovered about a fortnight before my visit; and before I left no less than fifteen claims in succession, occupying a linear extent of more than a mile, were reported to have struck gold. This reef, so far as I was able to judge from the shallow depth to which any of the workings had reached, presented features still more singular than those of the Morning Star. The shaft which I examined (No. 1 North) exhibited the following descending section:—First, about twenty-six feet of a decomposed rock (more trappean than granitic), of a reddish or reddish-brown colour, mottled with spots of pale dirty yellow, and containing crystals of white mica; then followed a seam or bed of auriferous quartz, six feet thick, and about four or five feet wide (the breadth of the reef); this was succeeded or underlaid by twelve feet of a brown-coloured rock of the same texture and appearance as the first-mentioned, but more micaceous; beneath this was auriferous quartz, which had only been penetrated to a depth of two feet, and in which gold was plainly visible, though in fine particles. The quartz terminated, like the decomposed trappean rock, abruptly at the walls, and thus presented even more strikingly than the Morning Star the appearance of a horizontal *bed*."

Murchison, has suggested that the rocks were impregnated with it after the miocene period, and but "a short time before the epoch when the powerful and general denudations took place which destroyed the large extinct mammalia." It is presumed, therefore, that all the drifts formed previous to the miocene period would be non-auriferous, and that during immense periods of time the denuding forces would be operating on veins which contained no gold. It is not possible in a short paper to discuss this theory, but to neglect it altogether would be to deal unfairly with the material interests of the country. There are large areas in this colony occupied by miocene and mesozoic rocks; and if there are any grounds for believing that these strata are not barren, they should be stated.

With the knowledge of Sir R. I. Murchison's labours—devoted almost exclusively to geological investigations for a great many years—the writer believes he is not wrong in supposing that that geologist will reconsider an important question if new facts be stated in regard to it.

If we examine the quartz veins at Castlemaine and at Clunes, we find that very minute particles of gold—quite invisible to the naked eye, and hardly to be seen with a powerful microscope—are disseminated through masses of hard, dense quartz, showing conclusively, it is suggested, that the gold and the quartz were deposited in the vein at the same time. Are there any forces known to the chemist which would be adequate to effect the dissemination of metallic gold in such a medium?

It is certain that these veins were formed long prior to the mesozoic period, and the proofs are to be found in the granitic districts.

This statement is, however, in one sense unsatisfactory. Geologists at a distance may conclude that inferences have been wrongly drawn from facts accurately stated.

In strata which it is believed are of miocene age, gold has been found. At Tea Tree Creek, not far from Steiglitz, some 350 feet below the auriferous pliocene gravel, fine gold has been obtained. The well-known mining engineer, Mr. R. M. Serjeant, of Ballarat, thus states the fact:—"Two days after I wrote to you we came on a floor of compact sandstone grit about one foot in thickness, and then fine drift with *flattened* well-washed boulders or pebbles of quartz. This drift contained large quantities of pyrites. We sunk in it eight feet and again struck black clay, with large pieces of trees, &c., and a *little fine gold.*"

Gold has been found, it is well known, in Nova Scotia in rocks of carboniferous age.

The Rev. W. B. Clarke—whose opinions on all questions relating to gold-bearing rocks are received by every geologist with respect and confidence—has stated, in a letter addressed lately to the editor of *Dicker's Mining Record*, that gold has been "detected at the Mint from even secondary rocks of Queensland;" and he says—"I conceive that there is nothing extraordinary in urging the possibility of gold being found in the miocene drift."

As already stated, there is not space here for discussion, nor even for a complete statement of facts; but it may not be entirely without interest to know the opinions of the writer on these questions. Abundant opportunities of acquiring information, and careful thought, have led him to take a practical view of these questions. The results may be stated thus:—Our quartz veins were formed prior to the mesozoic epoch. Gold was deposited, in the greater number of veins, contemporaneously

with the quartz; but all the veins were not formed at the same time, nor in the same way.

Gold will be found in all drifts and strata which have been derived from the palæozoic rocks; those strata of marine origin, however, from the nature of their formation, will rarely contain gold in such a form as to remunerate the miner—the gold will exist in very fine particles, and will be so distributed in the rocks as to be with difficulty recovered. Gold is found plentifully in modern drifts, because the rocks forming the drifts have not generally been much moved.

Gold is deposited every day in all rocks, of whatever age, which are below what is called the "water-line."

In obedience to laws which are not understood, gold will be accumulated in veins and fissures, rather than in the lines of bedding of the boundary rocks.

Gold exists as an ore.

The yield of gold will increase with the depth below the "water-line;" but not probably to a great degree.*

It is satisfactory to reflect that, whether these opinions are well-founded or not, we have abundant sources of gold in our quartz veins at a moderate depth, and the quite recent alluvions and tertiaries are so rich, and occupy such great areas, that it is not probable the labours of the miner—except, perhaps, because of some accidental discovery of rich and easily-worked gravels of the mesozoic or miocene age—will be devoted to explorations in rocks which, at the best, probably will be expensive to work.

In the early days of the goldfields the quartz veins were neglected. The miners directed their attention alone to the alluvions, and when they discovered small particles of gold imbedded in quartz they looked upon them with surprise. So little was known of the modes of occurrence of gold, that pieces of quartz containing only small quantities of gold, and worth only a few shillings, were sold for £10 or £15. When, finally, they came upon a rich reef cropping out at the surface, and saw large fragments of quartz thickly studded with gold, they commenced to break it up. With the aid of a hammer they pounded the quartz, and obtained the gold either by washing or by amalgamating with mercury. So rich was the matrix that many miners earned in this manner from £6 to £10 per week. Gradually the character of the reef became apparent, more extended explorations were made, better appliances for crushing and grinding the quartz were obtained; and at length, when experienced miners (acquainted with the use of stamps and the dressing of ores) came to the colony, quartz mining

* The way in which gold is distributed in rocks has led to many mistakes. If it were as plentiful as the ores of copper, or lead, or iron, and not more valuable, or if it were as easily traced as a bed of coal or lignite, we should hear of few controversies regarding its mode of occurrence. Gold in great quantities is not found every day in certain strata; the fact of its existence in connection with them is not *forced* on the mind; and many persons, obliged to hold some belief, are unable to admit the possibility of its occurring at all, or in any form, in these strata. They are incapable of judging of evidence, and do not seek for proof. This condition of mind has always operated as the most serious obstacle to the progress of science. The result is seldom so plainly shown as in this colony and in America, where, but for apparently rash explorations, undertaken through ignorance, the geology of gold would not have been made known to the world.

began to engage the attention of a great number of persons. Few believed, however, that it would continue to be profitable, and none guessed how important this interest would become. At the present time there are 17,730 miners engaged in quartz mining; more than 2000 distinct reefs have been discovered and named; and 522 steam-engines, equal to 9079 horse power, and 62 engines, driven by water or horse power, are employed in crushing, winding, pumping, &c. In place of small machines driven by engines of ten or fifteen horse power, we have batteries of stamps and large establishments, the like of which it is believed cannot be found in any other gold-producing district in the world. Energy and skill and capital are now employed successfully in the extraction of gold from the matrix, and day after day very important additions are made to the engine-power on the goldfields. At the same time, fresh discoveries tempt the quartz miner to abandon the old mines. At Wood's Point, Stringer's Creek, Donnelly's Creek, Crooked River, Tambo River, and numerous localities in and around Beechworth, valuable reefs are being prospected; and if it were not for the great cost and difficulty of carriage, as large establishments for reducing quartz would be erected at these places as at Clunes, or Ballarat, or Sandhurst.

From estimates made very carefully—which, however, are not absolutely correct—it appears that the quantities of gold obtained from quartz veins were, during the three years undermentioned, as follows :—

	ozs.	dwts.
1863	493,499	0
1864	503,618	5
1865	450,000	0

In working a quartz vein, a shaft is sunk either on the crown of the hill where the vein is found, or the reef is penetrated by an adit; and as the dip of the reef is commonly at a high angle, lateral excavations are made from the shaft or adit at various levels, from which the auriferous rock is excavated. The quartz brought to the surface is broken into pieces, and passed through inclined spouts to the stampers, which resemble the ordinary stamps used in other countries for dressing ores. They weigh about seven hundredweight each, and one stamp strikes about sixty blows per minute. A ten-horse power engine will give motion to eight stamps. The crushed quartz is carried by water over copper ripples, where the gold is brought in contact with mercury. Once a week, or oftener, the ripples are cleaned out and the amalgam retorted.

A great many inventions for the extraction of gold from quartz have been brought from time to time under the notice of the public. Where sulphides occur in considerable quantities, a good deal of gold is lost if care and skill are not employed, but a thoroughly-competent manager never fails to extract the greater part of the gold. It is not new inventions that are wanted so much as ability and a faithful and honest use of known appliances; and this truth is illustrated at Clunes, where the difficulties are many and the quartz by no means very rich.

The following brief statement of the operations of the Port Phillip and Colonial Gold Mining Company, who have a large and valuable property at Clunes, has been compiled by Mr. R. H. Bland, and it will be read everywhere with interest by those who are engaged in quartz mining.

"There are five reefs included in the workings, and the length of drives in each is as follows :—

	Feet.
Western vein	4,460
Robinson's vein	6,060
Old Man vein	580
Eastern vein	8,290
Welcome vein	1,020
	20,410
Add crosscuts	5,180
Giving a total of	25,590

which is equal to $4\frac{7}{8}$ miles.

"The depth of the main shaft is 464 feet; but little quartz has, however, been taken out below the 374 feet level. The length of the claim in the direction of the strike of the reefs is 440 yards, or a quarter of a mile. The thickness of the reefs varies very much, and may be stated as follows :—

	Feet.
Western vein about	9
Robinson's vein, varying from 3 to	30
Old Man vein " "	150
Eastern vein, about	4
Welcome vein, varying from 5 inches to	30

"These veins are larger in depth, as well as more irregular in size.

"The length of tramways on the surface for the conveyance of quartz and mullock amounts in the aggregate to about 2500 feet of single track. The engine power used in hauling and pumping at the two shafts is about 85-horse power.

"*Character of the Veins.*—There are five principal veins, the middle one being for the most part hard barren quartz, and on each side of this non-productive mass there are two veins running nearly north and south in the direction of the cleavage of the slate. The westernmost veins underlie west, and those on the eastern side east. The quartz occurs in these veins in large shoots dipping north and south in opposite directions from the summit of the hill. These shoots of quartz are in some places thirty feet wide, while the continuation of the vein immediately above and below them is small. The quartz in three of the veins is of a more or less brown compact character, and not generally hard; but in the two middle veins it is white, and more associated with raw pyrites and of a harder nature. The pyrites occurs in veins and patches, and when accompanied by galena is generally rich. The gold mostly occurs in the lines of fracture in the quartz, but it is sometimes seen at the side of the quartz in the slate, and the most auriferous quartz dips north and south with the shoots above alluded to. This is more particularly the case as the mine gets deeper.

"*Cost of Raising Quartz.*—This may be set down at an average of about 13s. per ton, including cost of machinery and dear work in the mine, and delivery at the reduction works. The contracts for breaking out the quartz underground average from 4s. to 9s. per ton.

"*Surface Operations.*—The quartz when brought to the surface is separated into two lots. The small size is tipped into a large hopper, and from thence drawn and delivered direct to the stamps; and the larger lumps are sent to the stone-breaking machines to be reduced to a size suitable for the stamps. Two of these machines are in constant use, working an average of about ten hours per day. Each machine will break about

eight tons per hour when in good order, at a cost, including wear and tear, of about 10d. per ton. They are driven by a shaft from one of the battery engines, and take about 12-horse power to drive the two.

"The number of stamps at work is eighty, as follows :—*Fifty-six heads* of about 6 cwt. each, including lifter and tongues, driven by one 24-inch engine, giving about seventy-five blows per minute, taking about 1-horse power per head, and crushing an average of about 2 tons 4 cwt. per head for twenty-four hours; *twenty-four heads* of about 8 cwt. each, including lifter, &c., driven by a 24-inch engine, giving seventy-five blows per minute, taking in the aggregate about 30-horse power. These stamps crush about 4 tons per head per diem, and they have a larger proportion of the small material sent to them. The average quantity of quartz crushed per week of five days is about 1130 tons.

"The following is a return of quartz crushed for the twelve months ending September, 1865 :—

54,413 tons............... 20,596 ozs. 10 dwts. 12 grs............... 7 dwts. 13 grs.

"The gold above mentioned was collected in the following way :—

Stamp beds	66·08 p. c.
Mercury boxes	22·95 p. c.
Blankets	10·97 p. c.

"The quantity of water required to work the stamps efficiently is about eight gallons per head per minute, which is 921,600 gallons per diem.

"*Method of Separating Pyrites from the Tailings.*—The *tailings*, on leaving the stamps, run into settling-boxes, where the current is checked and the heavier material settles. These boxes are cleaned out every few hours, and the material sent to the *buddle*, where it undergoes a further concentration, and is dressed up to an average of 3 ozs. or 4 ozs. of gold to the ton of material. This is then sent to the roasting furnace, and afterwards ground in Chilian mills with mercury; and an average of about 85 per cent. of the assay contents of the gold is thus extracted. The cost of operating on the pyrites, including the *buddle*, roasting, grinding, loss of mercury, &c., averages about £2 14s. per ton, or about £1 per ounce of gold obtained. The expense will diminish as the quantity of pyrites increases and it improves in richness.

"*Gold Crystals.*—These are obtained from a mercury-box placed at the foot of the blanket strakes, which is placed there to catch stray particles of mercury, occasionally driven out of the upper boxes, as well as any fine gold that may have passed the blankets. These boxes are cleaned out about once in four or six months, and it is found that the gold contained in them has become crystallised. The largest crystal we have noticed was the size of a pea. The crystals would no doubt increase in size if left for a longer period.*

"*Quantity of Quartz Crushed.*—The quantity of quartz crushed and yield of gold, from the commencement of the company's operations in 1857 to the 31st July, 1866, is as follows :—

Quartz crushed.	Yield of gold.
308,661 tons	180,723 ozs. 15 dwts. 10 grs.

Equal to 6 tons of 2000 lbs. each."

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* These crystals are of the highest interest to the mineralogist. Mr. Bland has given me some, which will be exhibited.

The statement made by Mr. Bland should be perused and carefully considered by every one who is interested in quartz mines. It shows what can be accomplished by good management and the use of well-devised appliances; but even skill and knowledge, and the aid of good machinery, will fail to give satisfactory results without honest and faithful supervision.

The usual course pursued, when a rich vein is discovered by those who are in haste to make money, is to form a company, and to put machinery on the ground at great cost, and to crush enough of the rich quartz to give notoriety to the mine. The original proprietors sell out when this is accomplished, and the property is left, in many cases, in the hands of men who are not well acquainted with mining. After a time the reef is probably lost, the machinery comes to a standstill, and the adventure is abandoned. The proper and honest course is to test the vein, to raise a great quantity of quartz and to ascertain the probable yield of gold from it (which is easily done, and with great accuracy by any one of experience), before incurring the expense of erecting crushing mills.

Fortunately for the colony, there are many able men engaged in the work of extracting gold from quartz; they possess the requisite knowledge, and exhibit, too, very often, perseverance and energy which are truly surprising. Those who have seen their establishments in the centres of mining industry, and in the more remote parts of the colony, must admit that we are not behind any gold-producing country in the world.

Many districts are, however, neglected. Very rich reefs have been opened up in the neighbourhood of Beechworth, but little has been done to develop them. Capital, it is said, is wanting; but why capitalists should hesitate to engage in mining speculations in places where the stone yields on the average as much as 1 oz. 7 dwts. and 1 oz. 3 dwts. per ton, on quantities exceeding 150,000 tons, is inexplicable.

If any proofs are required of the value of our auriferous quartz veins, they are to be obtained from the records of the Mining Department. From returns made by the mining surveyors and mining registrars of the yield of gold from parcels of quartz crushed during a period of seven years (from 1859 to 1865), it appears that 3,110,328 tons have yielded on the average 12 dwts. 6·375 grs. of gold per ton. These figures represent only the "crushings" respecting which the officers of the department have been able to obtain information, and do not show the quantities of quartz put through the mills; but there is no reason to believe that the average yield would be less if all the millowners had furnished returns.

In the report of a commission* appointed to inquire into the mining resources of the colony of Victoria, which is without date, but appears to have been laid before Parliament sometime during the year 1857, the miners were told that they must not expect to find gold in quantities to remunerate them beyond a certain depth—and this is fixed at forty or sixty feet; and capitalists were cautioned against the erection of great permanent mining buildings on a gold quartz reef. Sir R. I. Murchison had predicted that rich veins would not be found at any but small depths below the

* It is right to state that one of the members of the commission stands in the foremost rank of scientific men in Europe, and it is only from a sense of duty that I refer to the report. Learning, and zeal, and great ability are not always sufficient to prevent error, and one should be careful not to surrender one's reason to mere authority.

surface, and to support his theory (which some practical geologists had contradicted) a few cases of reefs growing poorer as the depth increased were cited.*

* In order to show that in other countries this theory has done harm, and that what has been termed a "scientific induction" is a mere guess made after a not very careful examination of a small area of country, I would direct the attention of the reader to the following extract from *Dicker's Mining Record*. The paper was published, originally, in the *Alta California*:—

"The great quartz mines of the State are now attracting earnest attention, since long and persevering experiment has at last divulged the true nature of the ledges and the most effective mode of developing them. The quartz district, having a breadth of from fifteen to one hundred miles, commences in the south-east or Mariposa district, runs north-westerly along the foot-hills of the Sierra Nevada five hundred miles longitudinally through the centre of the State, until it passes into Oregon, and melts away on the Pacific shores. The ledge has generally an eastern dip, and at different angles, from nearly horizontal to perpendicular. The veins, of varying lengths, range from a few inches to some twenty-five feet or more thick. Throughout this, ridge-holes have been punctured with more or less success according to the skill, sagacity, perseverance, and capital of the operators. These have, indeed, been misled by various theories of inexperienced science as to the nature of the deposits, by ill-founded opinions as to the depths to which the ore extends; and many shafts have been abandoned for various reasons. Numbers have, however, been very successful. But the great exemplar of quartz mining, not only for wealth or production, but as shedding more light upon the real nature and condition of quartz mining than most others, seems to be that of A. Hayward, Esq., at Sutter Creek, Amadar County. His mine is 1200 feet perpendicular descent from the surface, probably 300 feet below the ocean. It is by all odds the deepest gold mine in the world, and also the most productive. Yet the conditions of its yield are such as to indicate that its powers are barely developed, that it settles the question of deep mining, and that the wealth of gold contained in that mountainous ridge is far beyond the wildest dreams of the most sanguine Californian hitherto. Mr. Hayward, a lawyer by education, having had some experience in the lead mines of the Upper Mississippi, pushed across the Plains early in the gold excitement, and reached California in 1850. After much exploration, his attention was fixed at Sutter Creek, Amadar County, in 1853. A mine had been commenced which satisfied the conditions that his sagacity and experience had laid down. He became interested one-fifth, and went to work with that indomitable will and perseverance which, like faith, move mountains. The vein was but eight to ten dollars rock, but broad, and with difficulty was worked, at a time when flour was sixty dollars per barrel, wages in proportion, and living very high. With those high expenses and poor rock he struggled for years. In 1857 he was heavily in debt, but, having bought out all the partners, he had become sole proprietor. While he had carried on this desperate struggle, many around him dropped out of the race. They had been frozen out, and were forced to abandon their shafts, overwhelmed with debt. Mr. Hayward was not to be baulked. He had not spent a dollar uselessly, and he observed that the ore improved as the shaft grew deeper. The vein was broad, so that in following it down the shaft formed itself. Not a shovelful was taken out that was not reduced. The east wall of granite went down nearly perpendicular, and that was closely followed. At some hundred feet in depth the ore paid from twelve to fifteen dollars. The expenses being kept within the closest limits, this began to pay, and each succeeding year it has given greater results, until at the depth of 1200 feet the ore averages twenty-five dollars, with a breadth of twenty-two feet, and widening as it leaves the shaft in both directions, north and south. At this depth the present writer picked out samples of ore from masses of probably fifty-dollars rock. The smooth granite wall rises nearly perpendicular 1200 feet to the surface, and the timbering is done between the walls. The logs are hauled some six miles at a cost of six dollars each. The gallery runs north and south along this wall. The 1000 feet level is some 5000 feet in length, communicating with three shafts, giving perfect ventilation; from this the ore has been mostly removed. The lower level is some forty feet long, and at either end is the beautiful quartz with its blue and white vertical

One instance to the contrary is sufficient to destroy the theory, but perhaps it may be more satisfactory to give many.

A crushing of 865 tons from the claim of the *Sisters Company*, at Little Bendigo, near Ballarat, obtained at depths from 474 to 520 feet, yielded nearly half an ounce of gold to the ton.

The *Victoria Company*, at Clunes, crushed 3700 tons of quartz from which 1654 ozs. of gold were obtained, being nearly 9 dwts. per ton, and the quartz was won at a depth of 550 feet.

The *Victoria Company*, Clunes, crushed 3365 tons; the greatest depth from which it was taken was 500 feet, and it averaged 6 dwts. 15 grs. per ton. A subsequent crushing by the same company of a lot of 3920

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ribbons glittering with the metals. At this depth the value of the ore at the north end improves faster than that of the south end—rather reversing the process above. Some of the ore here is forty-five to fifty dollars, and some ranges probably to nearly a hundred. The ore above in the galleries, and that here in sight, is equal to three years run, say 2,000,000 dollars. Into this depth drop iron buckets, suspended by strong ropes of continuous length, manufactured by San Francisco works. These ropes, passing over swifters at the top, wind over drums worked by a hundred-horse engine of the most approved pattern for service. This operates night and day. Three sets of hands relieve each other every eight hours below, and sixty tons per day are sent to the surface, dumped into a rail car, which descends by its own weight to the mill, a short distance on Sutter Creek, so named from the fact that Sutter once mined there. The mill runs forty stamps of 450 lbs. each, at a speed of some eighty strokes per minute. The rapid trituration of ore and sulphides is found much more effective than the slower strokes of heavier stamps. The mill is driven by water in the wet season. This is brought by a flume from a very substantial dam above. A powerful engine is also at hand; and at this season, when water runs low, it assists the water-wheel, gradually increasing in power until, later, the water is taken off altogether and reserved for washing. The "clean-up" every fourteen days varies slightly in results, the tendency being always to increase. The ore is not selected, but always that is taken which most facilitates the operations of the miners. No day's work is thrown away, and no stroke of the pick made that does not tend directly to the main point of getting ore. This is the secret of success. From this mine, which has been worked for the last thirteen years by Mr. Hayward—himself a most experienced and skilful operator in every branch of the business—assisted by three able men (Messrs. Hazlehurst, Morgan, and Hunter), there has been extracted probably six to seven millions of dollars. This is a great fact; but, what is more important to the public, a still greater fact presents itself, viz., that quartz veins increase in width and value in proportion to depth. The mine in question shows a true fissure—an injection of gold-bearing quartz from below, and which tapers off in size and value as it approaches the surface. Following it down a distance of 1200 feet has demonstrated this fact. There are no other mines that approach this in depth. The Eureka mine, in Grass Valley, is 300 feet down, but is of richer rock than was the Sutter Creek mine at that depth. The ore is of the same appearance in both. Considering all these circumstances, the public will have to look forward to a gold production in this State of a magnitude compared to which all that has gone before is nothing. It is to be borne in mind that miners now have not to encounter the fearful trials that beset Mr. Hayward's early struggles. The cost of living is barely one-fourth; wages are less than one-half; transportation is greatly reduced; steam and rail now bring both Sutter Creek and Grass Valley, 190 miles each from San Francisco, within twenty hours' journey without breaking a night's rest; and lastly, money, instead of being 10 per cent. per month, is 10 per cent. per annum. Capital is now so abundant and so understandingly employed, that no man who has a good mine need want capital to work it. The facilities of travel into Nevada and Amador countries will soon embrace every important section, and tap every reservoir of wealth.'

tons, taken from depths up to 570 feet, averaged 6 dwts. 20 grs. per ton.

Thirty tons taken from a vein in the *Mariner's Reef*, Maryborough, which at the depth of 560 feet was ten inches thick, yielded 160 ozs., being at the rate of 5 ozs. 5 dwts. 16 grs. per ton.

The *Sisters Company*, Little Bendigo, near Ballarat, crushed 200 tons, obtained at a depth of 567 feet, which yielded 96 ozs. 18 dwts., being an average of upwards of 9½ dwts. to the ton.

At depths of from 400 *to* 500 *feet.*

In the claim of the *Albion Company*, at Steiglitz, the stone obtained at 400 feet averaged 9½ ozs. of gold to the ton. The manager in his report says :—"The yield of gold has been steadily increasing with the depth of the vein, and at the above depth the average yield is more than at any crushing since the formation of the company."

The *Victoria Company*, Clunes, crushed 2898 tons from a depth of 406 feet, with a yield of nearly 6 dwts. per ton. Between this and 460 feet, 2814 tons yielded an average of 4 dwts. 11 grs. per ton.

The *Sisters Company*, at Little Bendigo, near Ballarat, crushed 2763 tons from depths varying from 429 to 470 feet, and the yield of gold was 6½ dwts. per ton of quartz crushed.

Campbell's Reef, at Moyston, proved to be very rich at from 400 to 450 feet. Various companies crushed 4512 tons of stone, which yielded an average of 1 oz. 2 dwts. 16 grs. per ton. Two lots, of 224 tons and 402 tons, included in the above, yielded averages of 2 ozs. 2½ dwts. and 1 oz. 12 dwts. 19 grs. respectively.

The *Cross and Flat Reefs*, at Pleasant Creek, yielded stone at depths of from 400 to 460 feet from which gold was obtained averaging 1 oz. per ton from over 4000 tons crushed.

A parcel of 482 tons from a depth of 400 feet at *Thornhill's Reef*, Maldon, averaged 15 dwts. per ton.

The *Homeward Bound Company* obtained from the Rocky Point Reef, Stanley, 550 tons, yielding 18 dwts. per ton. It was raised from a depth of 400 feet.

A crushing of 80 tons from the same depth on the *Rose, Thistle, and Shamrock Reef*, Buckland, averaged 3 ozs. per ton.

At depths of from 300 *to* 400 *feet.*

At *Thornhill's Reef*, Maldon, a lot of 146 tons of stone was obtained from a depth of 310 feet, which yielded 221·3 ozs., or an average of about 1½ oz. per ton.

At *Nuggety Reef*, Maldon, from a depth of 300 feet, 1212 tons were obtained, which yielded 902 ozs., or nearly an average of ¾ oz. per ton.

Johnson's Reef Company, Eaglehawk, obtained from a depth of 325 feet 116 tons of stone, which yielded an average of 18 dwts. per ton.

During the two latter quarters of 1864, the *Port Phillip Company*, at Clunes, crushed a total of 26,354 tons of stone, obtained from a depth of 300 feet to 374 feet, and which yielded a total of 10,119½ ozs., or an average of more than 7½ dwts. per ton.

The *Hit or Miss Company*, Redcastle, obtained from a depth of 300 feet a lot of 35 tons of stone, which gave an average of nearly 5 ozs. to the ton. Another lot of 56 tons was obtained from the same depth at

Clarke's Welcome Reef, in the same locality, which yielded nearly 3 ozs. to the ton.

The *Albion Company*, Steiglitz, obtained from a depth of 320 feet 80 tons of stone, which yielded an average of $2\frac{1}{3}$ ozs. of gold.

The *Homeward Bound Company*, Rocky Point, Stanley, produced from a depth of 300 feet a lot of 45 tons, which yielded an average of $3\frac{1}{10}$ ozs. per ton. The reef at this depth is 2 feet thick.

Five hundred and sixty-seven tons from a depth of 340 feet were obtained by the *Band of Hope Company*, Little Bendigo, which yielded 422 ozs., or nearly $\frac{3}{4}$ oz. per ton.

A lot of 410 tons of stone, from a depth of 385 feet, was obtained from the old prospecting claim on *Poverty Reef, Tarnagulla*, which yielded when crushed over 1 oz. per ton.

The *Moonlight Company*, Pleasant Creek, obtained 808 tons from a depth of 360 feet, which yielded more than $\frac{1}{2}$ oz. per ton.

At the depth of 320 feet, 1510 tons of quartz were obtained from *Blucher's and Ironstone Reef*, at Maryborough, which yielded an average of nearly $\frac{1}{2}$ oz. per ton.

The *Britannia Company*, Carngham, obtained an average yield of upwards of $5\frac{1}{2}$ ozs. to the ton from 3198 tons of stone, taken from different depths reaching to a maximum of 340 feet. It is reported that the quality of the stone does not vary in any material degree at the different levels.

The *Energetic Company*, Victoria Reef, Long Gully, obtained from a depth of 305 feet 105 tons of stone, which yielded an average of more than $14\frac{1}{2}$ ozs. per ton. Also the *Comet Company* in the same locality obtained 2039 tons from a depth of 360 feet, which yielded upwards of $1\frac{3}{4}$ oz. per ton.

The *Eaglehawk Union Company*, Maldon, obtained 1295 tons of quartz from a depth of 300 feet, which yielded an average of upwards of $3\frac{1}{3}$ ozs. per ton.

The *Alabama Company*, Caledonia Gully, Heathcote, obtained a lot of 374 tons of quartz, raised from a depth of 300 feet, which yielded an average of upwards of $1\frac{1}{2}$ oz. per ton.

The *Energetic Company*, Long Gully, had a crushing from the Victoria Reef of 1294 ozs. from 55 tons of quartz. This stone was obtained from a depth of 305 feet. The last reported crushing (for the first quarter of the current year) of the same company gives an average of upwards of $14\frac{1}{2}$ ozs. to the ton of stone.

At depths of from 200 to 300.

The *Bolivia Reef*, at Castlemaine, at 200 feet averaged over 1 oz. to the ton. One crushing of 140 tons averaged $5\frac{1}{2}$ ozs.

Tyson's Reef, Sandhurst, has yielded a large amount of gold. One lot of stone from a depth of 200 feet yielded 1 oz. per ton.

The *Reef* named "*Poverty*," at Tarnagulla, has proved to be one of the richest in the colony. At 200 feet depth it yielded 600 ozs. of gold weekly. At 300 feet, in claim No. 5 north, the reef was 6 feet thick, and averaged from 6 to 7 ozs. per ton.

The *Sclavonian Reef*, at Redcastle, proved very rich at a depth of 250 feet; four crushings of 33, 32, 22, and 30 tons yielded 11, $6\frac{1}{2}$, $15\frac{1}{2}$, and $12\frac{1}{4}$ ozs. per ton respectively.

The *New Chum and Cross Reefs*, at Pleasant Creek, at depths of from 270 to 300 feet, averaged nearly 13 dwts. per ton.

The *Britannia Reef*, at Carngham, has yielded a large amount of gold. At a depth of 250 feet the stone averaged about 7 dwts. per ton.

Two lots from *Fenteman's and Perkin's Reefs*, Tarrangower, each of 6 tons, yielded respectively an average of 1 oz. 10 dwts. and 3 ozs. per ton. It was obtained at a depth of 240 feet.

Twenty-three tons from a depth of 200 feet on the *Catherine Reef*, Eaglehawk, yielded 341 ozs. of gold, or nearly 15 ozs. per ton.

The *Yankee Company*, Clunes, in 1860, crushed about 120 tons weekly, obtained at a depth of 230 feet, which yielded at the rate of 1½ oz. per ton.

The *Albert Reef*, at Whroo, was 2 feet thick at 245 feet deep. The gold was uniformly diffused throughout the stone, and averaged about 12 ozs. to the ton.

The *Hicks Reef*, Gordon's, at 210 feet, was about 18 inches thick. A crushing of 30 tons yielded 30 ozs.

During the first three quarters of 1864, the *Port Phillip Company*, Clunes, crushed upwards of 30,000 tons, obtained at depths of from 230 to 300 feet, which averaged nearly 7 dwts. per ton. Since that date they have attained a depth of 370 feet, and the yield is stated under the head of quartz obtained from over 300 feet.

The *Cornish United Company*, Ballarat, crushed 1000 tons, from a depth of 200 feet; average, 4 dwts.

Bow and Co. obtained from a depth of 200 feet, out of the *Rose, Thistle, and Shamrock Claim*, a lot of 800 tons of stone, which yielded an average of over 1¼ oz. per ton.

Two separate lots of 3000 tons each have been obtained by two different companies on the *Oriental Reef*, which were raised from a depth of from 200 feet to 250 feet, and which yielded an average of 10 dwts. and 6 dwts. respectively when crushed.

The *Prince of Wales Company*, Cobblers, obtained from a depth of 380 feet below the surface, but only a few feet below the level of the bed rock, 2007 tons of stone, which averaged when crushed over 12 dwts. per ton. The reef from which the stone was taken at the above depth was 12 feet thick. Subsequently it is reported as 17 feet thick, at a lower depth.

The Surveyor for the St. Arnaud Mining Division reports as follows of a reef, named the Jerejaw, lately discovered near St. Arnaud:—"It differs from most reefs by taking a remarkably straight course for three-eighths of a mile; its bearing is 29° east of south; it is about a foot and a half thick, and has very little underlay. Two crushings from it of 24 tons and 35 tons have yielded respectively 72½ and 20 ozs. of gold. Besides gold, there are found in it sulphurets of lead and iron, also grey sulphuret and green carbonate of copper; and chromate of iron has also been seen in it. There is an elvan underlying flatly across it, which, with the metals found in it, give indications of its depth and permanence."*

The figures here cited are sufficient to convince even the most sceptical that theories formed on insufficient data are likely to be dangerous and

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* More than 300 specimens of auriferous quartz have been collected from the mines in all parts of the colony, and these will be exhibited. They have been taken out of the veins at various depths; and the stataments in this paper will be strengthened and confirmed, if persons who are interested in this question will peruse the catalogue and carefully examine the blocks of quartz.

injurious to science, as well as to retard the progress of a country. A man who had examined the goldfields at Sandhurst, and who had known no other, would probably form theories which would prevent him from seeking for gold at Ballarat or Daylesford; and in like manner the geologist who has made a hasty survey of the Ural may not be in the best position to direct the miners of Victoria and New South Wales. We should receive his hints with respect, but his theories should not be blindly accepted, nor should we make the grave mistake of accepting as laws governing the distribution of gold those rules which are applicable only to limited areas. A person possessing local knowledge, and with the power to observe, is a better guide in the bush than one who has gained a knowledge of the country from maps and books; and, in the same way, one who has worked in a deep lead, and found gold in it, is able to dispute with the most learned man who may have predicted that gold would not be found under basalt.

AURIFEROUS ALLUVIONS.

There are 65,484 miners engaged in getting gold from the auriferous alluvions; and 4131 machines of various kinds, and 5835 sluice boxes, and 621 sluices and toms, are used exclusively in this kind of mining. The quantities of gold obtained by the alluvial miners during the past three years are, as nearly as can be ascertained, as follows:—1863, 1,133,567 ozs.; 1864, 1,041,831½ ozs.; 1865, 1,093,801 ozs.

The deposits of gold are found at various depths; in some places in the soil at the surface, and at others as far down as 300, 400, and 500 feet. The strata are of different ages, and their character and position determine the mode of operations.

Gold is obtained in many places from the shallow gullies and the auriferous soils in the vicinity of quartz veins by the old-fashioned methods. The tub and cradle are still used by the poorer miners, even on the old goldfields, and the prospector who finds a new goldfield is glad to avail himself of these. The Chinaman may be seen everywhere scraping the earth from the hill sides, or laboriously draining old excavations in the shallow alluvions, in order to get at the washdirt; and if he is not able to purchase a horse and a puddling machine, he washes the earth in boxes and cradles. When the goldfields were first discovered, very large quantities of gold were obtained by the simple process of washing the earth in a tub, and nuggets of large size were unearthed from quite shallow pits. The picture of the digger in a red shirt, stooping over a pool of water and washing the sand taken out of the tub or cradle in a large shallow tin dish, was twelve years ago familiar to every colonist. Then the hill sides were clothed with grass, and lofty trees gave a pleasant shade. The ponds and waterholes were not everywhere filled with mud; and the parrot and the cockatoo, and perhaps a startled kangaroo or an emu flying from its enemies, reminded the immigrant that he was in a strange land. Now the scene of his labour is changed. The forest in the vicinity of the older workings has disappeared; the hills, dug over and over again, are white and yellow, and red and brown; railways, macadamised roads, well-made streets, and large and lofty buildings, have entirely altered the aspect of the once well-known creeks and gullies.

Where the position of the strata admits of it, gold is separated from the earth by the operation of *sluicing*, and in a few places by the *hydraulic*

method. The latter is not common, owing to the expense attending the collecting and conveying of the great quantities of water necessary for its proper performance. By means of a hose, the under strata are washed away and the bank is excavated without the aid of the pick or shovel. The water is used at the same time to separate the gold from the earth, proper channels being cut for the purpose. When a plentiful supply of water is available, this plan will find favour amongst the miners; and large areas, which cannot be profitably worked in the ordinary way, will no doubt be made to yield the gold which they contain. In *ground sluicing* a narrow excavation is made in the alluvium down to the bed rock, and the stream of water diverted into this channel at once aids in the work of excavation and washes the soil, leaving the gold in the hollows and crevices of the rock. From time to time these are cleaned out, and the gold freed from adhering clay and earth by washing in a pan. *Box sluicing* is performed in the following manner:—Narrow boxes of sawn wood, inclined at a low angle, and from twenty to forty feet in length, the one delivering into the other, are fitted with ledges of wood which act as ripples, and into these boxes the auriferous earth is thrown. The stream of water running through the boxes is mixed with the soil by a workman who rakes the box continually with an iron fork, and the earth is thus washed off, leaving the gold in the ledges formed by the wooden stops or ripples. A perforated iron plate at the end of the upper box separates the coarse gravel from the earth washed down into the lower boxes. At the close of the day's operations the wooden ripples are lifted, and all the gold and fine sand are made to fall into a large bucket, after which the metal is washed off clean in a tin dish. As much as £7, £10, and £20 per week are earned by the industrious miner by this method where the earth is rich and the supply of water sufficient. Many of the races are some miles in length, and in the Beechworth district large sums of money have been expended on works for the conducting of water.

As little as four grains of gold to the load of earth will remunerate the miner where this method can be applied with facility.

Those who have stated that the shallow alluvions are exhausted have made a mistake. Even the old drifts at Ballarat, Castlemaine, and Sandhurst yet offer profitable employment to a great many miners; and they will for a long time continue to yield great quantities of gold. At the old diggings at Dunolly heavy nuggets are found nearly every day, and large areas of auriferous ground there, and in other parts of the Maryborough District, have not yet been touched by the miner. In the shallow alluvions in the Gipps Land Ranges, and in the north-eastern angle of the colony, at the sources of the Murray, we may expect to find hundreds of tons of gold, without penetrating the deeper tertiaries; and in these tracts a plentiful supply of water will admit of the ground being *sluiced*, or worked, by the hydraulic method.

When we leave the quite recent deposits which are due to forces now in operation, and where we can trace the gold to its source (either to the auriferous reef on the hill or to the older gravels which the modern stream has cut into and transported), and proceed to consider the character, position, extent, and age of the auriferous tertiaries, we meet with many difficulties. It is not possible to do more than guess at the age; and the evidence most often has to be sought for, not in the fossils which they contain, but in the relation which these tertiaries bear to other adjacent

formations. But though it is true that the geological age cannot yet be fixed with that precision which is desirable, the limits are sufficiently well defined for all practical purposes. The deep *leads* which up to this time have been explored are not older, it is supposed, than the Pliocene; it is believed that no *marine* production has yet been found associated with gold drifts, and miners are nowhere employed in getting gold from drifts underlying fossiliferous strata. All these statements may appear to accord with the old theories, and thus satisfy the indolent mind, but they must be received with caution. Negative evidence is sometimes rudely destroyed. Thus it has been affirmed that marine fossils have been found in the deep *leads* at Creswick, but whether truly or not it is impossible at present to say. Gold has been found, it is alleged on the authority of a person whose character is above suspicion, in the Geelong tertiaries, but gold dust may have been lost and scattered at the point from whence he took the earth. Moreover the deep *leads* and other strata have been but imperfectly explored, and at any moment all the old theories may be upset by the finding of gold in fossiliferous rocks of the tertiry or secondary age.

In order to reach the older auriferous deposits it is necessary to sink deep shafts; and in consequence of the course of the *lead* not being apparent on the surface, it frequently happens that the shaft penetrates the bed-rock at a considerable distance from the *gutter*. In such a case the shaft is sunk through the schist to a sufficient depth, and exploring drifts are carried as far as 1200 feet or 1500 feet before the auriferous gravel is touched. The quantity of auriferous drift overlying the palæozoic rocks at Ballarat is very considerable. It is found not only in the main leads, but also in the numerous tributaries of these, and in isolated patches.

The *washdirt* varies in thickness from 1 to 12 feet, and the average yield of gold is from 10 dwts. to 2½ ozs. per cubic yard. The mines at Ballarat are rapidly extending southwards; and, travelling from the Dividing Range towards Rokewood, one sees everywhere tall chimneys and engine-houses, and vast spoil heaps. The shafts vary in depth from 50 to 500 feet. They are lined and supported by wooden slabs about 8 inches in width and 2½ inches in thickness, and there are two compartments fitted with slides in which cages run. Many of the mines are extensive and well-conducted, and they are under the control of managers who are fully competent to undertake large and important works.

The auriferous earth is composed of quartz-gravel, sand, and clay, and the gold occurs in small grains, scales, and occasionally in large water-worn pieces, weighing sometimes as much as 1000, 2000, or 3000 ozs. The mode of extracting the gold from the earth is simple, and the machinery employed is inexpensive. The puddling-machine consists of a wooden box forming the circumference of a circle, within which two harrows are made to move either by a horse travelling round the circle or by steam-power driving a shaft. A sufficient quantity of water is made to flow into the box or channel, and the earth is slowly washed. The box is cleared from time to time, and the resulting rich sand is passed through a *cradle*, and the gold finally washed clean in a tin dish. In some districts where the *washdirt* is composed of water-worn quartz pebbles strongly bound together by iron oxide and argillaceous and siliceous cements, it is crushed under stamps, and the gold extracted by amalgamation with mercury, exactly as is done with auriferous quartz obtained from veins.

Deep *leads* are found at Ballarat, Creswick, Daylesford, Smythesdale, Moorabool, Raglan, Ararat, Sandhurst, Malmsbury, Taradale, Indigo, in the valley of the Ovens near Beechworth, Maryborough, Carisbrook, Talbot, Avoca, &c., &c. The cost of sinking shafts varies, of course, with the character of the rock to be penetrated and the amount of water to be contended with. At Ballarat, where the drift is covered with a great thickness of basalt, the cost of sinking is great. It is difficult to give an average, but perhaps 30s. to 40s. per vertical foot for a shaft measuring 5 feet by 3 feet would be an approximation. Some idea of the nature of the operations may be gained from an examination of the following sections :—

WHITE HORSE LEAD, BALLARAT.

	Feet.
Surface soil	2
Basalt, clay and soil	10
Basalt	54
Clay	37
Basalt	79
Clay	46
Basalt	45
Black clay	12
Brown clay	16
Drift and gravel	7
Washdirt	11
Total depth	319

KOH-I-NOOR COMPANY, GOLDEN POINT, BALLARAT.

	Feet.
Basalt	111
Light brown clay	10
Gray clay	15
Basalt	70
Brown clay	11
Schist rock*	154
Total depth	371

INKERMANN LEAD, BALLARAT.

	Feet.
Surface soil	4
Basalt	85
Blue clay	4
Drift	4
Red sandy clay, with water	36
Slate reef*	77
Washdirt	6
Total depth	216

INDIGO MAIN LEAD, BEECHWORTH DISTRICT.

	Feet.
Red and white clays	30
Gravel	30
Red and brown clays	40
Red sand and drift	20
Red gravelly clay	5
Gravel	4
Washdirt	0½
Total depth	129½

When the first difficulties are overcome—when the miner reaches the *washdirt*—his reward is great. For years he may have been contending with hard rock, with loose wet drift worse than rock, or spending his time uselessly in driving galleries in the wrong direction, but when at last he touches the gutter he finds wealth. Gold which has been hidden for perhaps millions of years—gold which has been purified by contact with water and air, whereby the base metals have been oxidised and carried away—is presented to his view. Every shovelful of earth is valuable, and not a handful of it but gives evidence of the great forces which, during the lapse of ages, have ground down and washed the detritus of quartz reefs and slates.

The following return of the yield of gold from a few claims at Ballarat, which has been compiled by Mr. Harrie Wood, District Registrar, is instructive :—

	Value of gold obtained.		
Sir William Don Company—From Nov., 1865, to 6th Sept., 1866	£62,375	6	8
Great Extended Redan Gold Mining Company—From June, 1861, to 6th Sept., 1866	438,289	7	11
United Extended Band of Hope Company—To 6th Sept., 1866	387,138	8	5
Albion Gold Mining Company—From Dec., 1861, to 6th Sept., 1866	175,420	5	0
St. George's United Gold Mining Company—To 30th Aug., 1866	69,948	18	4
Koh-i-Noor Gold Mining Company—From 1859 to 6th Sept., 1866	390,990	0	0

* Bedrock sunk through to attain the level of the gutter.

The block claims of the above-named companies comprise an area of 1400 acres, but only 232 acres of ground have been worked out. The average yield of gold per acre, therefore, is nearly £6570. It is not surprising that mines of such value should be well managed, and that all modern improvements, including the lighting of the galleries by gas, should be eagerly adopted and fairly tried.

It is impossible, in a brief statement such as this is, to give any accurate account of the several strata found on the goldfields. At Ballarat, Creswick, Raglan, Yandoit, Daylesford, and other places, fossil wood, wood almost unchanged, soft mud enclosing leaves so little altered as to preserve their fragrance, as well as fossil bones belonging to the *marsupialia*, are frequently found. The leaf shales from Daylesford are very interesting. If the fossils are slightly rubbed with the finger the distinctive odour of the *Eucalyptus* is at once perceptible.

Rolled fragments of sulphide of antimony have been found in the deep leads at Ballarat, by Mr. R. M. Sergeant; and Mr. E. J. Bateman, of Talbot, and Mr. Newman, of Avoca, have forwarded a large collection of specimens of native lead, which have been taken out of the deep leads in those localities. Many of the specimens are richly studded with grains of gold. Some of the pieces are a little water-worn, and others apparently not much changed in form. There is no reason to believe that these specimens are not genuine, but they have not yet been analysed. Mr. Newman was good enough to inspect the washdirt, and he says he is convinced that the lead occurs in considerable quantities in the Avoca main *lead*.

NUGGETS FOUND IN THE ALLUVIUM.

The number of large nuggets which have been found in the colony, and respecting which information is available in the records of the Mining Department, is 98, and the aggregate weight is 36,218 ozs. 2 dwts. 22 grs., showing an average of 369 ozs. 11 dwts. 11 grs. Some of these weighed nearly 3000 ozs., and some as little as 5 dwts. It must be surprising to those who have carefully considered the question that the number is so small, but it must be remembered that a great number of nuggets have been found which are not included in this statement, and respecting which nothing certain is known. The formation of nuggets, strange to say, has been accounted for in various ways. Numerous theories have been invented to account for their origin. Some suppose that they have *grown* in the alluviums, getting larger day by day, and that they have increased by successive layers of gold being imposed on a solid nucleus! This may cause the reader to smile, but nothing affecting such subjects which is advanced by persons of intelligence is fairly a subject of ridicule. The fact that nuggets in general are almost free from impurities is, in the minds of some, an argument against their origin in common with small particles of gold in quartz veins; and, again, it is suggested that large pieces of gold are not *usually* found in veins.

Mineralogists state that the purity of alluvial gold is due to its having been exposed for long periods to the action of water and atmospheric air, whereby the silver, copper, iron, &c., which are alloyed with the gold in the veins, have been decomposed and removed. This explanation is so reasonable, having regard to the constituents of the minerals usually associated with gold in the alluviums, that it is almost startling to find any person bold enough to doubt the sufficiency of it.

Large pieces of gold have been found in quartz veins, and scarcely any large nugget has been unearthed which has not had a great quantity of quartz adhering to it or intermixed with it;* and surely it is but reasonable to conclude that nuggets have been formed in the veins in the same manner, and probably at the same time, as other smaller pieces of gold. That we have not found as many large pieces of gold in the veins as in the alluviums is just what might have been expected. Every superficial foot of auriferous drift represents many thousand feet vertical of veins; and until we shall have explored the existing veins completely, and ground them down and worked them to a depth equal to that operated on by the denuding forces in past ages, we cannot say whether or not the proportion of nuggets found in the alluviums is in excess.

MANAGEMENT OF THE GOLDFIELDS.

The Mining Statute, 1865 (Act 29 Victoria, No. 291), came into operation on the 1st January, 1866.

The enactment enters into all subjects connected with mining, almost to the most minute detail. Under its provisions a document is issued, termed a "Miner's Right," which is in force for one year, and it empowers the holder thereof to mine for gold on Crown Lands, on the payment of 5s. Under the former Act this charge was £1. This document can be taken out for any number of years not exceeding fifteen. There is also power for a Company to take out a Consolidated Miner's Right for all ground held by them under the Mining Board By-Laws. A holder of a Miner's Right may take up a quarter of an acre of land for residence purposes, which he is at liberty to assign to any other holder of a Miner's Right; and the "right" itself may be assigned. The extent of ground that may be held for mining purposes is determined by the local Mining Boards, and it varies in different districts.

Persons requiring to carry on business upon the goldfields are permitted to occupy an area not exceeding a quarter of an acre of Crown Lands, upon payment of £5 per annum. This license may be transferred to another person, who can, upon payment of a fee of 10s. and the surrender of the original licence, obtain a new one for the unexpired term. The value of all buildings held under Miners' Rights, or business licenses, is allowed to the owners in the event of the land being put up for sale; and the ascertained value is added to the upset price.

No person can sue before a Warden or in any Court to recover possession of any land, claim, share, &c., held by virtue of a Miner's Right, unless he

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* The *hundredweight of gold* discovered on Dr. Kerr's station, in New South Wales, was taken from a vein which cropped out on the surface. "The largest of the blocks was about a foot in diameter, and weighed 75 lbs. gross. Out of this piece 60 lbs. of pure gold were taken. Before separation it was beautifully encased in quartz." The "Blanche Barkly" nugget contained 2 lbs. of quartz, clay, and oxide of iron. The two large nuggets found at Dunolly, which weighed 2952 ozs., presented gold distributed through a rust-coloured matrix. The "Lady Hotham" nugget contained much quartz and sulphuret of iron. The large nugget found at Canadian Gully, Ballarat, showed gold finely intersected with quartz. Every nugget, whether large or small, which has not presented indications of having been very much worn, has borne with it proofs that it had been broken out of a vein. The most careless examination of any large piece of gold would satisfy the observer that it had not been formed differently from smaller pieces; but whatever is uncommon is, in the minds of some, marvellous.

was himself in possession of such a document or included in a consolidated right at the time his alleged title first accrued.

The Governor is empowered by the Act to grant leases and licenses for mining purposes.

The rents for gold-mining leases are fixed by the Regulations at £1 sterling per acre per annum; for mineral leases, at 2s. per acre per annum; and two per cent. on the value of the mineral or metal at the mouth of the mine; and the fee for searching licences is at the rate of £10 per annum sterling for every square mile so taken up.

Special leases for gold-mining purposes may be granted of an area not exceeding 100 acres, at a nominal rent, to discoverers of new goldfields.

The colony is at present divided into six mining districts, viz., Ballarat, Sandhurst, Castlemaine, Beechworth, Maryborough, and Ararat, and in each there is a legislative body termed a Mining Board. The members (ten for each board) are elected by ballot; and each *male* holder of a miner's right is entitled to a vote. The members hold office for twelve months, and are paid at the rate of £50 per annum each. These boards possess large powers, which are named in the Act.

Each district has its separate Court of Mines, which is a court of record and is presided over by a district Judge, who must be a barrister of not less than eight years standing. There is also one of the Supreme Court Judges appointed to act as Chief Judge of the Court of Mines.

The Courts of Mines have jurisdiction to hear and determine "all suits cognizable by a Court of Law or by a Court of Equity which may arise concerning any Crown Land claimed under miners' rights, leases, or licenses," mining partnerships, boundaries, contribution to calls, and generally all questions and disputes which may arise between miners in relation to mining upon Crown Lands. These Courts possess the necessary staff of clerks and bailiffs, whose several duties are defined by the Statute; and under its provisions minors and representatives may sue and be sued, and the Court can make an order requiring a Warden, Surveyor, or other officer to perform the duties of his office, and may obtain the assistance of accountants, engineers, and other scientific persons.

The Wardens on the goldfields, of whom there are forty, receive their appointment from the Governor-in-Council. The duties are mostly of a judicial character, and they act generally also as Police Magistrates.

As Wardens they hear and determine all suits cognizable by a Court of Law which the Courts of Mines are empowered to hear, and also they may proceed summarily to settle any dispute concerning any Crown Land, share, or interest in any claim.

The mode of procedure before a Warden in the first instance is to take out a summons (cost 2s. 6d.); this brings the case on for hearing, which is conducted in a manner very similar to cases brought before Justices in Petty Sessions. The Warden has to keep a register or record of all complaints and decisions, a copy of which must be furnished to persons interested, if demanded. Cases may be tried before assessors if desired, upon payment of two pounds (£2) for assessors' fees.

The Wardens forward to the Mining Department monthly reports of their districts, and receive, investigate, and report upon all applications for leases. The Mining Surveyors, fifty-three in number, survey the ground applied for under lease, and report to the Minister of Mines.

Officers are appointed by the Governor-in-Council, called Mining

Registrars, of whom there are fifty; they keep a record of all claims held under miners' rights, and issue certificates of title, make all transfers of sales of shares, and report quarterly to the Mining Department on the condition of the mines in their several divisions.

The mines of the colony are placed under a Mining Department, whose head has a seat in the Legislative Assembly and in the Cabinet.

SUPPLY OF WATER TO THE GOLDFIELDS.

In 1860-1, and subsequently, sums of money were voted by Parliament for the construction of water reservoirs on the goldfields, and several works were undertaken. Many of these have proved of great service to the miners, and to the inhabitants of the towns. During the late droughts they were the means of keeping employed great numbers of persons who were dependent on the mines for their support, and they furnished also good water for domestic purposes in places where formerly water in such seasons was not to be obtained.

The contour of the country is such as to admit of the construction, at no great cost, of very large reservoirs; and though the rainfall is irregular, and the evaporation very great, these are easily filled, and, even in what are called dry seasons, moderately well supplied.

Of late more than usual attention has been devoted to the subject of water supply, and extensive surveys have been conducted by Mr. H. O. Christopherson, under the direction of the Honourable the Minister of Mines, and several carefully devised schemes have been submitted for consideration.

The twenty-one schemes which have been proposed would cost about £1,161,700, and not one of them, it is believed, would not prove of permanent value to the country for gold mining, for irrigation, and for domestic purposes. Contracts have been entered into for some of the works to supply Geelong, and Sandhurst and Castlemaine, and it is probable that in a short time other extensive schemes will be undertaken.

METALLIFEROUS MINERALS, COAL AND LIGNITE, CLAYS, SLATES, AND MISCELLANEOUS MINERALS.

Silver.

The ores of silver are found and worked at St. Arnaud. They occur as embolite (chloro-bromide of silver) and as sulphides with iron pyrites, argentiferous galena, native silver, native copper, the ores of copper, anglesite, mimetene, zinc-blende, arseniate of iron, native sulphur, brown iron ore, ores of manganese, &c. The deeper the shafts the more encouraging, it is said, are the prospects. A fine specimen of silver in the Intercolonial Exhibition—obtained by Mr. Masters, of St. Arnaud—is worthy of attention.

About 750 acres of land are held under lease for silver mining purposes at St. Arnaud; and it is probable that, if the operations of the lessees be successful, a very large area will be occupied and worked.

According to the returns received it appears that the following quantities have been raised and smelted:—

	Silver ore. Tons.	Silver. ozs. dwts.
Previously—Up to 31st Dec., 1865	4,480	6,786 4
From 1st Jan. to 31st Dec., 1866	1,400	3,379 0
	5,880	10,165 4

The following statement of exports has been received from the Customs Department :—

Year.	Silver ore. tons. cwt.	Silver. ozs. dwts.
1861	10 6	—
1864	—	4,207 15
1865	—	4,954 0
Totals	10 6	9,161 15

Gold and silver alloys occur at Reedy Creek, a tributary of the Goulburn, d in many quartz reefs on the goldfields. The ores of silver are found, is said, at Pleasant Creek. Until the eye of the miner becomes accustomed to the ores, and until he is able to recognise them at sight, it is not likely, however, that any new discoveries will be made.

Tin.

Stream Tin (oxide of tin) occurs in many places in the mining district of Beechworth, and in the beds of the tributaries of the River Yarra, the River Thomson, and the River Latrobe. It has been found also at Taradale and Strathbogie. It is believed that veins have not yet been discovered ; but, those who are acquainted with the character of stanniferous vein stones will not be surprised to learn this. It is not easy to recognize these ; they might be found and thrown away, again and again, by men who have some pretensions to a knowledge of mineralogy—and it is not to be expected that the gold miner, if he discovered a vein, would know its value.

Considerable quantities of stream tin have been obtained from the Woolshed Creek and its tributaries, near Beechworth. It is not possible to form an estimate of the number of tons procured by the miners previous to 1864, but about 120 tons were raised during that year.

During 1865, 150 tons were raised and 30 tons were smelted.

The following statement of exports has been obtained from the Customs Department :—

Tin Ore.	tons.	cwt.
Previously—Up to 31st December, 1864	2364	7
From 1st January to 31st December, 1865, "black sand"	16	8
	2380	15

Tin.	lbs.
Previously—Up to 31st December, 1864, 160 ingots, say	4800
From 1st January to 31st December, 1865	3360
	8160

Ilmenite, pleonaste, tourmaline, zircons, quartz, &c., are found with the oxide of tin in the Yarra basin.

Copper.

Native Copper occurs at St. Arnaud, Specimen Gully, Castlemaine, and on the River Thomson, associated with other ores of copper. Blue and green carbonates of copper, and copper pyrites, occur in small quantities at Steiglitz, Castlemaine, Blue Mountains, Bendigo, St. Arnaud, Inglewood, Dunolly, Gipps Land, &c. Cuproplumbite is found at M'Ivor.

Though two leases of land had been granted for copper mining at Heathcote up to the 31st December, 1864, it does not appear from the returns furnished that any copper ore has been raised. One of the leases as been declared forfeited ; the other is still in force.

The vein of copper found near the River Thomson, in Gipps Land, has been to some extent explored, and it is said that in some places it is eighteen feet thick. Sulphides, black oxide of copper, and native copper have been obtained from this locality. A very large collection of fine samples of copper and the ores of copper, forwarded by Wm. Pearson, Esq., M.L.A., are exhibited. The attention of mineralogists is directed particularly to the specimen of native copper.

During the year 1865 nine licenses to search for the ores of copper, for an aggregate area of 5760 acres, were granted, and some of the licensees have applied for leases, in order that, under a secure tenure, they may open up the mines, and ascertain the value of them. One of the licenses was for land at Stringer's Creek, which is distant about seven miles in a south-easterly direction from the copper mines on the River Thomson.

Twenty tons of copper ore are returned by the Customs Department as having been exported; but this was not the produce of Victoria.

BISMUTH.

Two searching licenses, each for 640 acres, have been granted for Bismuth, which is said to occur at Wombat Creek, in the Mining Division of Omeo. Mr. Howitt, the Warden at Omeo, forwarded samples of the metal, and has promised to visit the locality and furnish a report.

MOLYBDENUM.

Molybdenite—*Sulphuret of Molybdenum*—occurs at Yackandandah in considerable quantities, and fine hexagonal plates have been brought to Melbourne. No attempts have yet been made to work the vein.

ANTIMONY.

Sulphuret of antimony and oxide of antimony are found at Heathcote,* Whroo, Anderson's Creek, Rutherglen, Maryborough, &c. Nearly all the antimony ores which have been raised have been obtained from the mines at Heathcote. A large proportion of gold is mixed with the antimony ores in these veins. According to the returns received it appears that the following quantities have been raised:—

ANTIMONY ORE.	tons.	cwt.	lbs.
Previously—Up to 31st December, 1864	1385	0	26
From 1st January to 31st December, 1865	729	0	0
	2114	0	26

Previous to 1865, 682¼ tons of mixed oxides, sulphides, quartz with gold, and refuse were raised and crushed, for the purpose of extracting the gold only; and 8 tons 10 cwts. of crude antimony, and 5 tons of regulus, were reduced from ores smelted promiscuously as experiments.

During 1865 five tons of ore were smelted on the land leased by Messrs. Coster, Field and Martin.

Ten lessees have failed to make returns for the past year; but there is reason to believe they have not raised any ore.

* Mr. Dardanelli has been in communication with Messrs. Johnson, Matthey and Co., assayers, of Hatton-garden, London, in reference to this ore. He forwarded a sample, and it was assayed with the following results:—

Metallic Antimony	54·35 per cent.	
Gold	8·175 ounces	per ton = 20 cwt. of ore.
Silver		per ton = 20 cwt. of ore.

One searching license, for forty-two acres at Blackwood, was granted in 1865. The following statement of exports has been obtained from the Customs Department :—

Antimony Ore.	tons.	cwt.
Previously—Up to 31st December, 1865	1215	[illegible]
From 1st January to 31st December, 1865	153	5
	1368	5

Interesting specimens of oxide and sulphide of antimony have been forwarded from Whroo by Mr. H. B. Nicholas, Mining Surveyor ; and Mr. R. M. Serjeant, of Ballarat, obtained a good many rounded specimens of sulphide of antimony from the gutter of the Koh-i-Noor claim, at Ballarat. The last-named contained a little lead.

Mercury.

One searching license for quicksilver was issued in 1864, but no discoveries have yet been reported.

Lead.

Native lead is found in small quantities in the auriferous tertiaries at Talbot and Avoca. Argentiferous galena, cerusite, anglesite, pyromorphite, mimetene, and other ores of lead, are found in the mineral veins throughout the colony.

Coal.

The area of the coal-bearing rocks is about 3000 square miles, or 1,920,000 acres. These rocks occur in Gipps Land, in the counties of Grant, Bourke, Mornington, and Polwarth, and in the Portland Bay District.

Four leases of land have been granted for coal mining purposes, for an aggregate area of 1827a. 0r. 20p.

The localities are near the sea coast, extending from Cape Paterson to Griffith's Point, in the County of Mornington. Three leases were in force on the 31st December, 1865, for an aggregate area of 1598a. 2r. 30p.

According to the returns received from the lessees, it appears that the following quantities have been raised :—

Coal.	tons.
Previously—Up to 31st December, 1864	1933
From 1st January to 31st December, 1865	—
	1933

The New Griffith's Point Coal Company report that they have increased the depth of their bore to 830 feet, and that they have entered into a contract to put it down to 1000 feet.

The lessee of the block lying to the west of Coal Creek states that he has not raised any coal during the year 1865 ; and the Victoria Coal Company, Cape Paterson, report that they have not raised coal since June, 1863.

The cost of transporting the coal to the place of shipment is very great ; and this, no doubt, has prevented the proper exploration and working of the mines.

Ten searching licenses for coal were granted during the year 1865, for an area of 5367a. 3r. 11p.; and three remained in force on the 31st December, for an aggregate area of 1319a. 3r. 11p.; two of these were for blocks of

land near Cape Paterson, and one at Geelong, where a bore has been put down to a great depth by the Newtown and Chilwell Coal Mining Company.

A discovery of coal shale has lately been made about ten miles north-west of Traralgon, in Gipps Land, and an application has been lodged for a lease.

Lignite.

Extensive deposits of lignite, some of great thickness, are found at Lal-Lal, Daylesford, and in Gipps Land.

Four leases of land for mining for lignite were in force on the 31st of December, 1865, for an aggregate area of 669a. 0r. 24p.

The "Victoria Brown Coal" and "Australia Lignite" Companies state that they are waiting for the results of experiments, which are being made in Europe, for the purpose of ascertaining the best and most economical method of compressing the material and preparing it for use. They are making inquiries in Bavaria and Saxony, and the Australia Company say they have an agent in Prussia for the same purpose.

The Victoria Patent Manure and Chemical Company have raised about 35 tons since the 7th of October last.

The leases of the two former companies are situated near the Lal-Lal Railway Station; that of the last-named company between the White Horse and Frenchman's Leads, at Sebastopol, near Ballarat.

According to the returns received it appears that the following quantities have been raised :—

	tons.
Previously—Up to 31st December, 1864	200
From 1st January to 31st December, 1865	35
	235

Kaolin and Other Clays.

Thirteen leases of land have been granted for mining for kaolin and other clays, for an aggregate area of 424a. 1r. 26p. The localities are Bulla-Bulla, Lal-Lal, and Dunolly. Two leases were in force on the 31st December, 1865, for an aggregate area of 24a. 2r. 18p.

The lessees of the block at Dunolly stated, last year, that they proposed to bring Chinese potters from Canton; but they have not yet, it appears, commenced operations.

Some attempts have been made lately to work the clays which are found to occur near Melbourne; but, as the lands are not held under lease, no information has been received from the company.

From returns received it appears that the following quantities have been raised at Bulla-Bulla :—

	tons.
Previously—Up to 31st December, 1864	1695
From 1st January to 31st December, 1865	62
	1757

Flags and Roofing Slates.

Seven leases for quarrying slate were in force on the 31st December, 1865, of an aggregate area of 379a. 2r. 24p.

The Chewton Flagging and Slate Company commenced operations in June, 1865, and by the end of the year had raised about 1200 square yards of flagging.

The Golden Point Flagging and Slate Company, whose lease is also situated at Chewton, report 300 yards as having been obtained during 1865.

The Victoria Slate Mining Company, Gisborne, have only just commenced operations. They state that they have taken out about 1000 slates.

The Penrhyn Slate Quarrying Company, at Wombat, near Creswick, report that they have got out about 43 tons during the year.

The Moorabool Slate Mining Company state that they have expended about £2000 on their leased ground. They are erecting sawing and planing machinery, and expect that they will be enabled, in a short time, to place flagging and roofing slates on the market.

Five searching licenses, for an aggregate area of 2090 acres, were granted in 1865.

Carbonate of Magnesia, or Magnesite.

No report has been received from the licensees, to whom three searching licences were issued.

Diamonds.

Locality: Beechworth. Diamonds have been obtained, it is said, from Reid's Creek, Wooragee, Upper Woolshed, Sebastopol, and El Dorado.

According to a statement prepared last year by Mr. Barnard, who was then Warden at Beechworth, it appears that forty* diamonds had been found, from one-eighth of a carat to two and a half carats; and the Mining Surveyor reported, on the 31st December, 1864, that a Chinaman had found a diamond at Sebastopol, weighing 17·64 carats.

Mr. Gaunt, the Warden at Beechworth, reports that fifteen diamonds have been found in a claim belonging to Mr. Finn, at the Woolshed, during the year 1865; they weighed from half a carat to one carat.

The numbers, as reported, therefore stand thus:—

Previously—Up to 31st December, 1864	41
From 1st January to 31st December, 1865	15
	56

Sapphires, &c.

No important discoveries have been made during the past year. One fine sapphire, said to have been found at Donnelly's Creek, was lately offered for sale in Melbourne. The sapphire, spinel ruby, topaz, and zircon, are found in the auriferous drifts; and it is probable that many valuable stones are thrown away every day. At Tubba-Rubba Creek, Mornington, and at the Blue Mountain (Trentham), very fine blue sapphires are found with crystals of zircon and powdered quartz. Fine specimens have been found also in the Yarra Ranges, where occur also the onyx, agate, &c. The topaz is found near Pleasant Creek, and some fine specimens have been brought from that locality.

TABLES.

Table No. 1 shows the quantities of gold obtained in the colony from the first discovery of the goldfields in 1851 to the 30th June, 1866. The total is 31,731,344 ozs., equal to £126,925,376. The yield of gold per man per annum has increased, and in 1865 it was greater than in 1862; the figures being for 1865 £74 4s. 2·09d., and for 1862 £67 14s. 5·11d. From an analysis of the yield it appears that, while the quantities of gold obtained by the alluvial miners as compared with previous years have increased to £66 16s. 3d. per man per annum, the average earnings of the quartz miners have decreased to £101 10s. 5½d. per man per annum.

* The owners of twenty-two of these are known.

This is occasioned by the increase in the number of quartz miners. The reefs present great attractions to the miner, and numbers have turned their attention to quartz mining; but in the earlier stages their labours were mostly devoted to prospecting and to the opening of new mines, and consequently the quantity of gold derived from veins is not in proportion to the numbers employed.

Since the first publication of the mining statistics, information has been obtained respecting the yield of gold from 3,110,328 tons of quartz which have been crushed in the colony. The average per ton was 12 dwts. 6·375 grs., and the price per ton of crushing ranged from 2s. 6d. to £1 10s.

It is remarkable that the average earnings of the miners during the past two years should be so high. We have had a succession of dry seasons, and the labours of the miners have been often interrupted. With a plentiful supply of water, it is probable that the yield of gold will greatly increase.

Table No. 2 is instructive. It shows the increase of machinery on the goldfields from 1859 to 1866; but a comparison of the figures in the table without some explanation would probably lead to wrong inferences. The value of all the machinery in 1859 was £1,155,923, and in 1866 £1,914,712; but, owing to the high price of carriage and the difficulty and cost of prôcuring machinery in 1859, the value as set down in the table is exorbitant. A better view is presented by comparing the figures which relate to the kind and character of the machinery employed. Whereas in 1859 we had 581 steam engines, representing an aggregate of 8196½ horse-power, we have now (in 1866) 973 steam engines, equal to 18,417 horse-power.

Taking the *mean number* of miners employed during the year 1865 (83,214), it appears that for each man there was an average of £23 0s. 2½d. invested in machinery; or, putting it in another form, for every acre actually occupied for mining purposes, £14 4s. 7½d.

The area actually occupied for mining purposes, including land held as claims, protected by certificates, and leased for gold mining, when distributed amongst the total number of persons engaged in mining, gives an average of only 1a. 2r. 18p. Of course, a great quantity of land not included in this estimate is from time to time occupied by miners; they forsake one piece to take up another, and the figures represent the condition of the goldfields at one period only. Moreover, large areas, but not in the aggregate exceeding 464,000 acres, are either occupied as claims or rendered useless for many other purposes by the nature of the mining operations; but still the gross area so occupied or withdrawn from other occupation is very small when compared with the large extent of the colony, the great number of miners employed, the enormous wealth which their labours produce, and the amount of the contributions of this class to the general revenue of the country.

The value of all the "claims" throughout the country, as estimated by the registrars and surveyors, is £8,498,924. These officers were directed to arrive at the value of the claims by consulting the quotations in the share-lists in cases where these would apply; and in cases where the mining properties were not included in the published lists, to make inquiries, and to use their judgment, guided by local knowledge and experience, in arriving at a fair valuation. From a careful examination of the figures furnished by them, it appears that they have discharged their duty with care and fidelity.

Table No. 7 shows the number of Miners' Rights and Chinese Protection Tickets issued in Victoria from the 1st June, 1855, to the 31st December, 1865. The number of Miners' Rights issued in 1865 was 24,495.

The next table gives an account of the water-races constructed in each mining district of the colony. The total length is 1936 miles 26 chains, and the total approximate cost £267,171, equal to £138 per mile. The quantity of water carried by these races per diem in ordinary seasons is 459,281,124 gallons. Many new races have been made in Gipps Land during the past year; and it is expected that, with the security of tenure afforded by the water-right licenses, a great number of larger reservoirs and races will be constructed by private enterprise in future years.

Tables Nos. 9, 10, and 11 do not need explanation. They give an account of the number of leases and licenses for mining purposes which were in force on the 31st December, 1865, and abundantly testify to the energy and enterprise of our miners.

With a climate which is admitted to be the best in the world for outdoor work, and with immense areas of rich land but imperfectly explored, it is certain that Victoria will always stand high as a mining country, and that her supplies of gold and silver, and copper, and tin and iron, will continue to add to the wealth of the world.

TABLE No. 1.—YIELD OF GOLD PER ANNUM.

Year.	Per Escort.	Exported.	Value, @ 80s. per oz.	Average yearly earnings per man per annum.
	ozs.	ozs.	£	£ s. d.
1851—For 3 months	104,154	145,146	580,584	30 1 7·60
1852	2,277,026	2,218,782	8,875,128	262 11 6·66
1853	2,065,903	2,676,345	10,705,380	202 15 0·81
1854	1,482,697	2,150,730	8,602,920	130 16 4·08
1855	2,132,397	2,751,535	11,006,140	100 7 2·75
1856	2,625,968	2,985,991	11,943,964	103 11 0
1857	2,481,020	2,762,460	11,049,840	83 7 9·59
1858	2,371,268	2,528,478	10,113,912	68 12 8·39
1859	2,202,012	2,280,950	9,123,800	72 10 11·27
1860	2,008,843	2,156,660	8,626,640	79 9 3
1861	1,832,887	1,967,420	7,869,680	74 15 11
1862	1,520,518	1,658,207	6,632,828	67 14 5·11
1863	1,420,302	1,626,872	6,507,488	70 9 0·42
1864*	...	1,544,694	6,178,776	74 1 9·29
1865	...	1,543,801	6,175,204	74 4 2·09
1866—For 6 months	...	733,273	2,933,092	...
	...	31,731,344	126,925,376	...

* The escorts from Castlemaine, Sandhurst, and Ballarat were discontinued on the 31st of March, 1864, and since that date the only escorts arriving in Melbourne are those from the Beechworth and Wood's Point districts; therefore, the returns being incomplete, are omitted.

NOTE.—From 1851 to 1858, inclusive, the gold obtained is estimated as divided amongst the *entire population of the goldfields*; since 1859, amongst only those *persons actually engaged in mining*. Certain amounts, which were stated in a note to the table of the yield of gold in the former Essay in 1861 as having left the colony by overland escort during 1852-3 and 4, have in the above return been included in the yield for those years, it having been ascertained by inquiry at the Customs Department that they should be so included. It is stated in a return made by the Registrar-General, that (in addition to these amounts) 1,267,241 ozs. were produced by Victoria in 1852-3-4 and 5, but passed through the Customs of New South Wales, Tasmania, and South Australia, and not recorded in Victoria; therefore, to arrive at the gross yield of gold, this quantity should be added to the figures in the table. The small remaining difference in the two returns, as made up to June, 1866, is attributable to the table in this paper being drawn up from returns recently amended by the Customs Department.

Table No. 2.—Increase of Machinery on the Goldfields.

In 1859 the machinery was as follows:—285 Steam Engines employed in alluvial mining, winding, pumping, &c., of the aggregate horse-power of 3821; 3982 Horse Puddling Machines, 396 Whims, 101 Wheels, 91 Sluices, 77 Toms, 113 Whips, 3 Hand Machines, 19 Horse Pumps, 8 Water-power Pumps; 296 Steam-engines employed in quartz mining, winding, crushing, &c., of the aggregate horse-power of 4357½; 7 Water-power Engines, 69 Whims, 1 Windmill, 4 Horse-gear Whips, 8 Horse Crushing Machines.—Total approximate value of all mining plant estimated at £1,155,923.

In 1866* the Machinery is as follows:—451 Steam Engines employed in alluvial mining, winding, pumping, &c., of the aggregate horse-power of 9,338; 2799 Horse Puddling Machines, 400 Whims and Pulleys, 110 Whips, 621 Sluices and Toms, 159 Waterwheels, 30 Hydraulic Hoses, 179 Pumps, 5335 Sluice Boxes, 3 Boring Machines; 522 Steam Engines employed in quartz mining, winding, crushing, &c., of the aggregate power of 9079; 62 Water and Horse-power Crushing Machines, 55 Waterwheels, 210 Whims and Pulleys, 6 Derricks, 74 Whips.—Total approximate value of all mining plant estimated at £1,914,712.

Table No. 3.—Number of Miners Employed in the several Mining Districts during the Quarter ending 31st December, 1865.

Mining Districts.	Alluvial Miners.		Quartz Miners.		Totals.		Grand Total.
	European.	Chinese.	European.	Chinese.	European.	Chinese.	
Ballarat District	10,113	3,856	3,195	6	13,308	3,862	17,170
Beechworth District ...	5,067	5,074	4,617	...	9,684	5,074	14,758
Sandhurst District	5,250	1,427	3,876	...	9,126	1,427	10,553
Maryborough District...	8,728	3,592	2,455	2	11,183	3,594	14,777
Castlemaine District ...	9,455	5,087	2,345	20	11,800	5,107	16,907
Ararat District............	2,613	1,869	810	...	3,423	1,869	5,292
Totals..................	41,226	20,905	17,298	28	58,524	20,933	79,457

Table No. 4.—Number of Machines Employed in Alluvial and Quartz Mining in the several Mining Districts during the Quarter ending 31st December, 1865.

ALLUVIAL MINING.

Mining Districts.	Steam Engines employed in Winding, Pumping, &c.		Puddling Machines.	Whims and Pulleys.	Whips.	Horse Pumps.	Sluices and Toms.	Water Wheels.	Hydraulic Hoses.	Pumps.	Sluice Boxes.	Derricks.	Crushing Machines.	Stamp-heads.	Boring Machines.
	Number.	Aggregate Horse-power.													
Ballarat District ...	267	4925	551	92	14	...	2	6	...	...	48	3	1	73	4
Beechworth do. ...	61	676	82	55	35	...	190	180	32	98	4220	...	...	...	...
Sandhurst do. ...	27	363	803	1	...	...	4	1	...	...	80	...	...	242	...
Maryborough do ...	45	716	851	160	10	...	34	...	1	4	...	...	1	...	...
Castlemaine do. ...	60	1263	798	79	49	78	182	7	...	...	8	5	3	184	...
Ararat do	23	266	144	20	7	...	236	...	...	...	72	...	20	12	...
Totals	473	8208	3228	127	115	78	648	196	33	102	4428	8	25	461	4

* Quarter ending 30th June, 1866.

TABLE No. 4—*continued.*

QUARTZ MINING.

MINING DISTRICTS.	Steam Engines employed in Winding, Crushing, &c.		Crushing Machines.	Stamp-heads.	Whims and Pulleys.	Water Wheels.	Derricks.	Whips.	Quicksilver Cradles.	Approximate Value of all Mining Plant.
	Number.	Aggregate Horse-power.								£
Ballarat District	117	2370	11	1090	18	11	15	2	...	573,350
Beechworth do.............	33	498	39	733	...	35	...	...	...	260,631
Sandhurst do...............	129	2288	4	1220	16	...	...	25	...	362,715
Maryborough do..........	75	1073	7	639	46	...	...	53	...	182,500
Castlemaine do............	116	1889	29	1127	125	10	...	15	...	304,145
Ararat do.	21	488	9	310	26	...	...	3	10	89,930
Totals.....................	491	8606	99	5119	231	56	15	98	10	1,773,271*

TABLE No. 5.—NUMBER OF DISTINCT QUARTZ REEFS ACTUALLY PROVED TO BE AURIFEROUS, AND THE TOTAL EXTENT, IN SQUARE MILES, OF AURIFEROUS ALLUVIAL AND QUARTZ GROUND ACTUALLY WORKED UPON, IN THE SEVERAL MINING DISTRICTS.

MINING DISTRICTS.	Number of distinct Quartz Reefs proved to be Auriferous.	Extent in Square Miles of Auriferous Alluvial and Quartz Ground worked upon.
Ballarat District	142	69$\frac{1}{4}$
Beechworth District	618	196 19-30
Sandhurst District	363	182$\frac{1}{2}$
Maryborough District............................	540	76 1-20
Castlemaine District	324	137$\frac{3}{4}$
Ararat District..	42	63 11-24
Totals	2029	725 77-120

NOTE.—The number of "distinct" quartz reefs cannot be strictly correct, as parts of the same reef, in some localities, are held to be distinct reefs, and named accordingly. As the reefs are further explored it is found, too, that what were supposed to be separate reefs are not really distinct.

The return of the area of auriferous ground actually worked on for 1864 is in excess of that for 1865. As now set down, it is but a rough approximation, and indeed cannot be otherwise. The area is less, in consequence of the Surveyors and Registrars having been instructed to make the computations on an uniform plan, and with great care; and it is believed that the figures given this year are not very far from the truth. But large areas of non-auriferous ground are included in some claims; and in other places, ground which was formerly held and worked by the miner is now under cultivation.

TABLE No. 6.—ESTIMATED VALUE OF THE CLAIMS IN THE SEVERAL MINING DISTRICTS ON THE 31ST DECEMBER, 1865.

MINING DISTRICTS.	ESTIMATED VALUE OF CLAIMS.
Ballarat District	£2,392,751
Beechworth District	1,875,267
Sandhurst District	2,016,806
Maryborough District	632,604
Castlemaine District	1,333,146
Ararat District...	248,350
Total	£8,498,924

* The approximate value of the Mining Plant on the 30th June, 1866, was £1,914,712.

Table No. 6—*continued.*

Note.—The instructions issued to the Mining Surveyors and Registrars, for the purpose of guiding them in forming an estimate of the value of claims in their divisions, were to the effect that they should consult the quotations on the share lists in cases where they would apply; and, in cases where the claims were not included in any share list, that they should endeavour, by their local experience, and by inquiries, to arrive at as fair an estimate as possible. It is believed that they have carefully followed their instructions.

Table No. 7.—Return of Miners' Rights and Chinese Protection Tickets issued in Victoria from 1st June, 1855, to 31st December, 1865.

Period of issue.	Miners' Rights £1.	Chinese Tickets.		
		£1.	£2.	£4.
1st June to 31st December, 1855	50,899	11,101	...	...
1st January to 31st December, 1856	54,655	12,199	...	...
1st January to 31st December, 1857	53,822	22,341	...	...
1st January to 31st December, 1858	49,314	28,179	...	...
1st January to 31st December, 1859	48,152	55,810	...	119
1st January to 31st December, 1860	44,571	31,368	1	1
1st January to 31st December, 1861	36,640	20,058	...	1
1st January to 31st December, 1862	35,078	906	...	1
1st January to 31st December, 1863	28,564	...	...	...
1st January to 31st December, 1864	28,718	...	...	...
1st January to 31st December, 1865	24,495	...	...	...

Table No. 8.—Length of Water-races Constructed, and their Approximate Cost, in the several Mining Districts, to 31st December, 1865.

Mining Districts.	Length of Races.		Approximate Cost
	Miles.	Chains.	
Ballarat District	395	4	£36,375
Beechworth District	1084	40	206,047
Sandhurst District	32	60	2,184
Maryborough District	147	8	7,326
Castlemaine District	191	34	11,319
Ararat District	85	40	3,920
Totals	1936	26	£267,171

Table No. 9.—Return of the Number of Gold Mining Leases in force on the 31st December, 1865, together with the Extent of Ground Leased and the Proposed Capital to be Employed in working the Ground.

Mining Districts.	Number of Leases.	Extent.			Total Capital Proposed.
		A.	R.	P.	£
Ballarat District	88	2,890	3	14	422,400
Beechworth District	300	5,326	3	20	1,384,200
Sandhurst District	318	2,303	0	28	650,190
Maryborough District	228	3,495	0	24	612,850
Castlemaine District	85	1,095	3	14	414,980
Ararat District	24	667	1	37	57,250
Totals	1043	15,779	1	17	3,541,870

Note.—The total number of gold mining leases granted since the commencement is 1815, containing 27,737a. 3r. 24p. Many leases have expired, have been forfeited, &c., during 1865. The above table shows those only which were actually in force on the 31st December, 1865.

TABLE No. 10.—RETURN OF THE NUMBER OF LEASES IN FORCE ON THE 31ST DECEMBER, 1865, FOR THE PURPOSE OF MINING FOR METALS AND MINERALS OTHER THAN GOLD.

NAMES OF METALS AND MINERALS.	Number of Leases.	Area. A.	R.	P.	Total Capital proposed to be invested.
Antimony	21	265	0	10	£33,950
Coal	[illegible]	1598	2	30	60,000
Copper	1	50	0	0	3,000
Kaolin and other Clays	2	24	2	18	2,600
Lignite	4	669	0	24	3,200
Silver	10	763	0	23	87,300
Slate and Flagstone	7	379	2	24	20,900
Totals	48	3750	1	9	£210,950

TABLE No. 11.—RETURN SHOWING THE NUMBER OF LICENSES TO SEARCH FOR METALS OR MINERALS OTHER THAN GOLD ISSUED DURING THE YEAR 1865.

NAMES OF METALS OR MINERALS.	Number of Licenses.	Extent of Ground held under License. A.	R.	P.
Antimony	1	42	0	0
Bismuth	2	1,280	0	0
Carbonate of Magnesia, or Magnesite	3	340	0	0
Coal	10	5,367	3	11
Copper	9	5,760	0	0
Flags, Roofing, Slate, &c.	5	2,090	0	0
Limestone	1	58	0	18
Totals	31	14,937	3	29

NOTE.—The following "Notice to Applicants for Licenses to search for Metals or Minerals other than Gold, under the Order in Council of 15th October, 1862," was published in the *Government Gazette* of the 2nd December, 1864 :—

Referring to the third section of the regulations under the Land Act, 1862, respecting licenses to search for any metal or mineral except gold, the following scale of fees payable for licenses issued under the said regulations is published for general information:—

For an area exceeding 320 acres but not exceeding 640 acres	£10	0	0
" 160 " " 320 "	5	0	0
" 80 " " 160 "		10	0
" 64 " " 80 "	1	5	0
And for any area not exceeding 64 acres	1	0	0

BLUNDELL AND FORD, PRINTERS, FLINDERS LANE WEST, MELBOURNE.

INTERCOLONIAL EXHIBITION ESSAYS, 1866-67.

No. 3.

NOTES

ON THE

PHYSICAL GEOGRAPHY, GEOLOGY,

AND

Mineralogy of Victoria.

BY

ALFRED R. C. SELWYN,

DIRECTOR OF GEOLOGICAL SURVEY,

AND

GEORGE H. F. ULRICH,

FIELD GEOLOGIST.

There rolls the deep where grew the tree—
O earth, what changes hast thou seen
There, where the long street roars, hath been
The stillness of the central sea.

The hills are shadows, and they flow
From form to form, and nothing stands;
They melt like mist, the solid lands;
Like clouds they shape themselves and go.

Tennyson.

NOTES

ON THE

PHYSICAL GEOGRAPHY, GEOLOGY,

AND

MINERALOGY OF VICTORIA.

GEOLOGY.

The catalogue of the Victorian Exhibition of 1861 contained, with other prefatory essays on "the progress, resources, and physical characteristics of the colony," a brief outline of its leading geological features, so far as they were then known. During the five years' interval the geological survey has steadily progressed.

There are now fifty-one geologically-coloured quarter-sheet maps published, each embracing fifty-four square miles of country. These maps are on a scale of two inches to one mile, and are mostly constructed from careful and minute transverse-survey, and every precaution and care has been taken to make them the best possible guides not only to the geology but also to the physical geography and mineral resources of the districts to which they refer. They are sold at the merely-nominal value of 3s. each, and are thus within the reach of every one. If read and studied (not merely looked at), they will be found each to contain in itself a concise geological report of the area embraced.

No illustrative sections have yet been made referring to the several quarter-sheet maps. This it is proposed to do when a somewhat-larger area has been mapped, and we are thus in a position to determine the best lines on which to construct them. In the meantime a system of lettering on the face of the map has been adopted, by which any one can at once ascertain the nature of the formations immediately underlying those occupying the surface (depicted by colour on the map) of any given area. Thus, G. 1, 2, or 3, indicates various kinds of granite, C. lower silurian, S. upper silurian, V. volcanic, T. tertiary, and the number attached to the letter the probable mineral or lithological character of the rock. In this way the letters V. 1 on T.P. 3 on C. 1, 2 indicate volcanic formation (basalt) resting on tertiary (gravel "pliocene" or lower gold drift) on a bottom of lower silurian (slate and sandstone). Or V. 1 on TM. 2 on M. 1, 2 on G. 1 would indicate volcanic (basalt) on tertiary miocene (sandrock), on mesozoic carbonaceous (sandstone and shale), on granite.

In 1863 a general sketch-map was published, on a scale of eight miles to one inch, geologically coloured, and has lately been republished in a

reduced form by A. Petermann in his widely-circulated journal. Plate 1 is a similar reduction lithographed to accompany the present paper. Though necessarily inaccurate in detail—except in those portions laid down from reduction of the larger maps—it will be found, together with the illustrative sketch-section, plate 2 (also reduced from a large unpublished section), to give a fair synopsis of Victorian geology so far as the determination of the geographical extent and relative distribution of the several formations may be so considered.

In a recent article in the *London Geological Magazine* on Victorian geology the writer says:—"The contrast between this map and the one of Great Britain is very great. We miss especially the evident lines of strike of the various formations which we are accustomed to see exhibited on maps of our own islands. Victoria seems to be formed of a great mass of palæozoic rocks, through which protrude large areas of granite and trap, and upon which repose, near the coast, belts of mesozoic and tertiary strata and volcanic products." This absence of lines of strike is doubtless in part due to want of detail; thus if the subdivisions of the upper and lower silurian, and possibly either of the cambrian or laurentian, formation were determined and carefully mapped, we should then probably have four or five more or less meridional parallel lines traversing the central and eastern portion of the map, but still interrupted by the granite areas; the feature noticed will, however, under any circumstances, continue to some extent to be characteristic of Victorian geological maps.

The sketch-map shows that the younger members of the tertiary or cainozoic series, and the older members of the primary or palæozoic series, are by far the most widely distributed, and in all other respects the most prominent and important, formations. With their associated granitic and plutonic or igneous, and volcanic rocks, they occupy nearly nine-tenths of the surface of the country. Thus—first, in the absence of all the intermediate European mesozoic and upper palæozoic formations; and secondly, in the great unconformity in strike that naturally exists when almost-undisturbed tertiary formations rest on broken, metamorphosed, and upheaved older palæozoic rocks—we have two causes to account for the peculiarity alluded to: and a third may be found in the total absence of the usual great, more or less parallel, bands of limestone that often characterise the lower palæozoic areas of the northern hemisphere.

In Victoria, though the upper palæozoic and mesozoic formations of Europe are not actually wanting, they are represented by isolated patches only, not occupying together more than 7586 square miles. These isolated patches, now found at distant intervals throughout the country, themselves afford good evidence that the formations they represent occupied in earlier geological times a far more prominent position in Victorian geology. And to persons unaccustomed to consider the probable effects of denudation in past geological periods it may seem strange to state that it may fairly be inferred from them, that what was once a great upper palæozoic formation, extending over the whole central portion of Victoria, is now only represented on the one hand by the beds forming the serrated ridges, picturesque slopes, and east-facing cliffs of the Grampians, and on the other by the rocky west-facing precipices of Timber Top, Mount Wellington, and Ben Cruachan, together with a few small outliers in the intervening country.

This small development of the middle portions of the great series of

geological formations, combined with the absence of limestones in both middle and lower, has, I think, a very important economic bearing; for, if we except gold, tin, and a few other but unimportant metals and precious stones, it is chiefly from these absent formations that the richest and most valuable mineral products, viz., coal, iron, copper, silver, lead, salt, mineral oils, marbles, &c., are obtained in large quantities; and thus, though nearly all the above and many others are known to occur in Victoria, few of them have been found in sufficient quantities to be profitably worked. This will probably be considered an unnecessarily-gloomy view to take respecting the mineral products of Victoria, but I think it useless to close our eyes to probable facts, because they are unpleasant and perhaps not in accordance with our wishes or preconceived theories. And we may in this case find ample consolation for this not-improbable deficiency in variety of mineral resources in the vast extent and surpassing richness of our gold-fields, which, with yearly-improving machinery, more efficient modes of working, and diminished cost of labour, will assuredly afford profitable employment for many future generations.

The accompanying list and description of Victorian minerals by my friend and colleague, Mr. G. H. F. Ulrich, affords the fullest particulars respecting every mineral at present known to occur in Victoria.

This list will by some, perhaps, be considered a practical refutation of the opinion I have ventured to express respecting the probable extent and variety of the mineral resources of this colony; but I would wish to point out the fact, frequently overlooked in the excitement of discovery, that the occurrence of a few specimens, however rich, does not necessarily indicate the existence of profitable mines.

In my last sketch of Victorian Geology, 1861, it was stated that in general structure, character, and composition, in geological sequence and in physical and palæontological relations, the rock formations in Victoria are in all respects analogous to those of other regions. The marked absence or small development in Australia of the formations (especially those of mesozoic age) between the older tertiary and the lower palæozoic has frequently been noticed, and made use of in support of a theory to account for the peculiarly mesozoic type of the living Australian fauna, by supposing that the whole of the Australian land had never been submerged after the close of the palæozoic period, and that no part of it had been subjected to the influence of mesozoic seas. The incorrectness of these facts, and consequently of the theory based on them, has been often pointed out by Professor M'Coy, though till within the last few years stoutly resisted by other writers; but the more our investigation and consequent knowledge of Australian geology has extended, the more conclusive has the evidence become in favour of Professor M'Coy's early opinions, based on purely palæontological evidence. And I have no doubt that, as accurate geological examination proceeds, it will be seen that the great gap, so to speak, which we now find to exist in the Victorian geological series, is due not so much to the missing links never having been present, but to their having been almost entirely removed by subsequent denudation. What the practical effects of this great denudation have been in the removal and dispersion of masses of strata, that might otherwise have remained to become the depositaries of useful minerals, we have little evidence to determine; on the other hand, we can safely assert that to it is due the presence at the surface, over such a large area, of the rocks that have

given rise to the golden treasures of Victoria, and which but for it would still be buried far beyond the reach of even "the strong arm of the miner."

The following descriptions of the several formations depicted on the sketch-map, with the assistance of the collections of rocks, fossils, and minerals exhibited, and the sketch-map and illustrative section, will, I think, enable any one interested in Victorian geology to acquire a tolerably accurate knowledge of all that is at present determined respecting it.

The labours of the past years have considerably increased our knowledge without materially altering anything previously stated, consequently the description then given only requires to be enlarged, in order to include the additional facts this extended investigation has afforded.

Though we are now tolerably well informed respecting the main features of the surface geology and physical geography of Victoria, yet when we look at the map of Australia, and note the comparatively-insignificant extent of this the least of the Australian provinces, and also consider that it is intimately connected in its physical geography and geology with those much larger neighbouring territories, it becomes apparent how difficult it is, without some more accurate knowledge of the latter than is at present available, to arrive at any sound or trustworthy conclusions on Victorian physical geography in early geological epochs; or on the origin, direction, and extent of the forces that have operated through each successive period, and resulted in its present surface configuration. It may, however, not be considered out of place, before proceeding to the statement of purely geological facts and details, to offer some remarks on this interesting subject.

It is generally supposed that the main axis, or greatest line of elevation, of any country, will be found to coincide more or less with the line of strike of its older rocks. In Victoria a great main range or watershed commences at the Grampians on the west, and extends eastward through the centre of the colony, culminating in Mount Kosciusko, in New South Wales, the highest peak of the Australian Alps.* The average elevation of this range is probably under 3000 feet; the highest peaks do not reach 7000, and the lowest passes or gaps are, I believe, under 800 feet. Its northern slopes are drained by the Murray, its southern by rivers emptying into the sea between Cape Howe and the 141st meridian, or western boundary of the colony; and the mean distance of this axis from the sea on the one hand and the river Murray on the other is about 50 miles. The sources of the respective waters frequently overlap each other, of which a notable instance occurs in the head waters of the Murrumbidgee and the Snowy River, where the dividing ridge or crest of the cordillera is, so to say, bent back upon itself, forming angles like those in the letter $\overset{a\ d}{\underset{b\ c}{N}}$ the line $a\ c$ being some 60 or 70 miles in length, and a distance of 40 or 50 miles intervening between $a\ b$ and $d\ c$. Many similar minor curves occur throughout the course of the range, till in about latitude 26° south it apparently again assumes, as in Victoria, an almost east and west course for nearly 300 miles, this portion forming the northern rim of the great Murray basin.

In every description hitherto published, treating of the physical geography of eastern Australia, we find it stated that the southern pro-

* Photograph No. 3.

longation of the great axis of elevation or Australian Cordillera is through Wilson's Promontory and the islands of Bass's Straits into Tasmania. Jukes, in his physical structure of Australia, 1850, states :—"A long but not lofty mountain chain runs along the whole eastern coast, crossing Bass's Straits into Tasmania." In the Handbook to Australia, edited by William Fairfax, 1859, the writer of the article on the physical geography of Victoria falls into a more glaring error when he states :—"The great range which divides the waters flowing northward to the Murray and those running southward to the sea extends from the Australian Alps to Wilson's Promontory, east of Western Port."

These later writers have apparently somewhat hastily adopted the statements, or rather inferences, of Count Strzelecki, who in the geological map, published in his work on Tasmania and New South Wales, 1845, also indicates a continuous range from the Alps, not exactly to Wilson's Promontory but rather more to the westward, between Cape Liptrap and Western Port Bay, and this error has been perpetuated in the "Exploration Map," published in Victoria, 1859, and in almost every published map of Australia.

Wilson's Promontory is the extreme south point of the Australian continent, and also of an almost insular mass of granite of about 166 square miles, extending from the sea level to elevations of nearly 3000 feet. Whether regarded in its orographical, geographical, or geological relations, this area is as wholly unconnected with the Australian Alps as is any other of the hilly granite districts of Victoria north or south of the coast range. It is completely separated both from the Alps and also from the Victorian main watershed by all the extensive low-lying tertiary tracts of Western Port and Gipps Land. The geological sketch-map clearly shows that the assumed southern prolongation of the Australian Cordillera is incorrect; indeed, so little elevated is the intervening land that if a depression were now to take place in the area in question of, I believe, considerably under 300 feet, Port Phillip Bay would be again connected with Lake Wellington in Gipps Land, as it certainly has been in recent tertiary times, and the high lands north of Welshpool and Western Port, Wilson's Promontory, Cape Liptrap, and Arthur's Seat would again form a cluster of islands in Bass's Straits; and a further slight depression would also insulate the Cape Otway Ranges, and many other groups of hills on either side of the coast range. Another well-known fact, which may perhaps be considered to have an important bearing in determining the true orographical and physical extension of the Cordillera, is the remarkable difference in the kinds of fish common to the coast and inland waters. The eel, so abundant in all the rivers and other waters of the sea slopes of the range from Lacipede Bay, in South Australia, lat. 37° S. to lat. 25° S. in Queensland, is entirely unknown in any waters of the inland slopes extending over eleven degrees of longitude and sixteen degrees of latitude, and the characteristic and most common fish of the Murray Basin* is equally absent from the rivers of the coast.

Thus, geographical, physical, and natural history considerations all tend to point out the east and west main drainage axis of Victoria, hitherto regarded as only a lateral spur of the great eastern chain, as its real

* Oligorus Macquariensis = Grystes Peelii, or Murray Cod of Mitchell. [Since the above was written, I have been informed by Mr. Wilson, from Grafton, that the Oligorus is found in the Clarence and the Richmond, but he believes it to be a different species from the O. Macquariensis of the Murray.]

extension. Probably the reasons that have caused it to be otherwise considered, are—first, the great deflection from its general course through New South Wales it makes on entering Victoria; secondly, imperfect acquaintance with the geography and geology of the country between Mount Kosciusko and Wilson's Promontory; and thirdly, the apparent connection of the latter point with Tasmania through the numerous granite islands of Bass's Straits; together with the now almost-exploded notion of the necessary connection of granite rocks with lines of upheaval, the fallacy of which can scarcely be better exemplified than it is by the distribution and relations of these rocks in Victoria.

It may now be interesting to consider the probable true dynamical theory of the origin and present configuration of this great East Australian chain. Having no personal knowledge of the chain to the northward and eastward of its culminating point at Mount Kosciusko, I am unable to state what probable influence the geological structure of that portion of it may have had on its present surface configuration. In tracing it through Victoria, however, we find that the drainage axis or summit of the range for fully two-thirds of its entire length, about 300 miles, is composed of rocks of upper and lower silurian age, having everywhere a more or less meridional strike, and a high alternating east and west inclination. Thus the strike of the older rocks constituting the mass of the main range is at right angles to the axis of the range itself, and quite uninfluenced by the granitic and other plutonic or basaltic rocks occasionally met with, equally on the range as on either side of, and remote from, its axis; clearly showing that the forces that have operated in determining the orographical features are quite independent of those that have acted in producing the tiltings and corrugations of the older silurian strata. And the fact that they are equally tilted and corrugated at the sea-level, or wherever else they are exposed to observation, as they are on the flanks and summits of the main range, may be regarded as further evidence to the same effect. Thus there is no essential connection between the orographical features and the geological structure of the Victorian coast range; neither, it appears to me, is there evidence of any great axial elevation in the usual sense of this term. On the other hand, it seems probable that the first outline of our coast-range, or of the existing main watershed, was determined by some slight and almost accidental undulation that may either have pre-existed in the old sea-bed, or been produced during one of the earliest broad and equable upheavals that resulted in a dry land surface. On this first-exposed dry land, denudation would at once begin to operate, and the waves beating on the shores, aided by the waters draining off the land of the slowly-rising continent, would at once commence to scoop out channels, and increase the slopes of the original undulation, and thus form the first outline of a river system and a mountain chain, which every subsequent similar broad and equable movement of depression and elevation with its resulting combined alternating and long-continued marine and atmospheric denudation would tend still further to develop and enlarge. The precise, or even the successive, periods at which the forces operated that have produced the excessive tiltings, foldings, and corrugations of the older rocks is uncertain. That they were altogether antecedent to, and independent of, any existing orographical feature, and that they have to a certain extent influenced the course and direction of many of the present (particularly the upper or tributary) drainage channels, seems not improbable.

Thus, in Victoria we find—the Yarra being, perhaps, the only exception—that the rivers on both sides of the main axis have a more or less meridional course, till they either reach the sea or some flat low-lying tertiary area in the valley of the Murray, or bordering the coast. This, as regards Victorian streams, might be accounted for by the general east and west trend of the main watershed alone, irrespective of the strike of the rocks; but if we examine the coast rivers of New South Wales, where the drainage axis is more or less north and south, we find that here also the rivers, especially in their upper branches and for long distances, maintain a similar meridional course, or parallel both to the coast and the main drainage axis—a circumstance difficult to explain, unless on some such hypothesis as above alluded to, viz., that when the present river system was first sketched out, the pre-existing meridional corrugation of the silurian rocks facilitated the formation, and to a certain extent determined the future course, of many of the drainage channels. That the old rocks were folded and plicated, and worn into hills and valleys, and probably metamorphosed, prior to the commencement of the submergence that resulted in the deposition of any, either upper palæozoie or mesozioc strata, is proved by numerous sections in which the junction of these formations is well exposed. And it seems probable that the atmospheric and marine denudation, consequent on the earliest appearance of the land from beneath the ocean, first indicated the line of many a still-existing silurian valley. Some of these old valleys have, doubtless, since been entirely obliterated, while all have been more or less modified and altered, both in form, direction, and depth. The energetic and long-protracted denuding forces of each succeeding geological epoch, that have sufficed to break up and remove vast masses of strata of upper palæozoic and mesozoic age, would also erode still further the already-deeply-furrowed silurian surface; and these, together with the great volcanic outbursts in tertiary times, are doubtless the chief agents by which the existing surface features have been fashioned.

Thus the orographical and physical features of Victoria, independently of such as are clearly the result of tertiary and recent volcanic action, appear to be entirely due to long-continued atmospheric and marine denudation, combined with repeated, slow, broad, and equable, or perhaps slightly-undulating, movements of upheaval and depression, unaccompanied either by great axial upheaval or any other excessive or sudden elevatory action.

The general absence of mountain lakes of any kind is a remarkable feature in the physical geography of the east Australian chain, and it is, perhaps, worthy of consideration, whether this fact may not be in some degree connected with the concurrent absence of evidence, either geological or palæontological, of a glacial period in Australia.

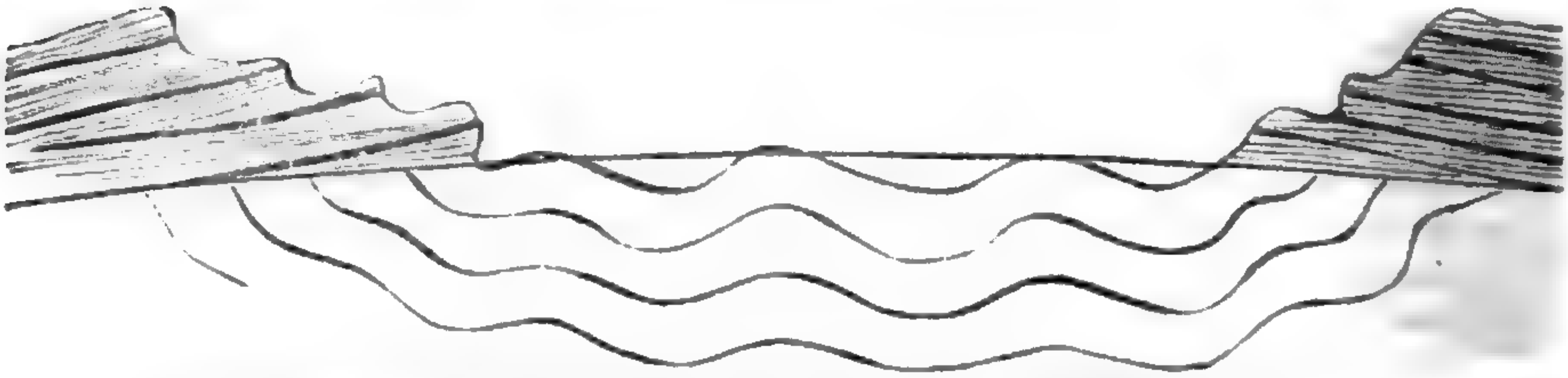
PRIMARY OR PALÆOZOIC ROCKS.

Under this head are included all rocks older than the Triassic, or New Red Sandstone, series. No rocks below such as are clearly of lower silurian age have yet been identified.

Victorian palæozoic physical geology in its broadest features may be represented as consisting of a great crumpled, contorted, and broken sinclinal trough of lower palæozoic (silurian) and older strata, overlaid

unconformably by an equally-extensive broken and undulating anticlinal arch of upper palæozoic, and perhaps lower mesozoic, rocks.

Fig. 1.



Proceeding westward from about the meridian of Melbourne, there seems to be a very gradually descending series, and towards the extreme limits of the colony, west of the Grampians, a group of strata is exposed consisting of foliated micaceous and chloritic telcose, and serpentinous schists with irregular beds and masses of hard brown quartzite, and numerous thin interlaminated beds and layers of white quartz surrounding a large central mass of granite. Little is yet known of the relations of these beds; and whether they represent a series older than lower silurian, or are some highly-metamorphosed lower beds of the Grampian sandstone group, is uncertain. The only other considerable development of somewhat similar micaceous and gneissose rocks is in the eastern and north-eastern portion of Victoria. The Omeo goldfield* is situated on this eastern outcrop, but no gold has yet been found in those west of the Grampians. Masses of felspar porphyry of a reddish tint, enclosing distinct crystals of orthoclase felspar in a felspathic clay base, are associated with them near Omeo and also on the Glenelg and Wannon. Similar porphyries have not been observed elsewhere in Victoria.

If we except the groups of strata representative of the middle silurian epoch, or from the lower Llandeilo beds to the upper Wenlock, the sequence, so far as it is at present known in the Victorian palæozoic series, seems very imperfect.

Apparently the only rocks in Victoria representing the European formations from lower Devonian, or old red sandstone, up to Permian inclusive, are those patches (chiefly sandstones and conglomerates) coloured Indian red, and marked No. 8 on sketch-map and section, together with one or two smaller areas in eastern Gippsland of hard blue and grey crystalline limestone, No. 16 (blue) of map. The few fossils† that have yet been found in these beds indicate them as probably Devonian. Similar calcareous rocks in New South Wales and Tasmania have long since been identified by Professor M'Coy as lower carboniferous, and it seems probable that some of the Victorian beds, especially the sandstone of the Avon, containing a *Lepidodendron*‡ scarcely distinguishable from the European *Lepidodendron elegans*, may also eventually be referred to the same period. As, however, they are entirely disconnected here with any other stratified rocks, and occur only as outlying patches on old porphyries, their true age and relations can only be determined by future knowledge of their organic contents.

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* Photograph No. 2. † *Spirifera lœvicostata* and Placodermatous fish of Russian old red sandstone. ‡ Do. No. 1.

LOWER PALÆOZOIC ROCKS—SILURIAN.

Rocks of this epoch are widely distributed in Victoria; they occur at all elevations, from sea level to over 5000 feet, and constitute the surface rock from the Grampians on the west to the extreme limits of the colony on the east, a length of over 399 miles, and from the shores of Port Phillip Bay to the Murray. With a few local exceptions, they have a nearly true meridional strike or direction. Their great longitudinal extent is due to the crumpling, folding, and corrugating they have been subjected to, causing the same beds to recur again and again at the surface, in a succession of great synclinal and anticlinal undulations. Making due allowance for this repetition of the same beds at the surface, the total vertical thickness of the series can scarcely be estimated at less than 35,000 feet. These rocks are the true "bottom" or "bed-rock" of the gold-miner.

The lower members of the group consist chiefly of schistose and slaty rocks, with numerous alternating bands made up of hard, gritty quartzose and soft micaceous sandstones, sandy-flags, and fine-grained freestone of fair quality. Conglomerate beds are very rare, and not a single associated band of limestone, or even calcareous sandstone, has yet been found. Numerous genera and species of graptolites (polyzoa) are the characteristic and most abundant fossils found in the lower beds. The only other forms yet discovered west of the meridian of Melbourne are Hymenocaris (abundant)—Siphonotreta and Lingula rarely. The colour and texture both of the slates and sandstones is very variable, even within short distances, and frequently specimens can be procured from one locality or even section presenting every shade of colour, from deep black through blue to pale grey, and from dark brown, purple, or red to white. Rusty red and brown are the prevailing tints at or near the surface, whereas dark blue or grey and greenish shades (the latter seldom if ever seen at the surface) are not uncommon in the "spoil heaps" from deep mine workings. The difference is probably due to the state of oxidation of the iron, which apparently constitutes the chief colouring matter of most of the silurian rocks. When in contact with granitic or trappean rocks, they are invariably more or less hardened,or otherwise metamorphosed, for limited distances from the line of junction, but the prevailing strike and dip of the beds is not in any way influenced, the former or the latter being frequently directly on to or against the granite, inducing the belief (which, I think, is in many instances actually the case) that such granites are in no sense intrusive or irruptive masses, but only the completely-transmuted ends of the silurian rocks that have either been lowered in early geological times to within the influence of central heat, or by some means been subjected to other powerful transmuting agencies; additional facts, noticed under the head of granitic and igneous rocks, seem also strongly to confirm the probability of this being the true origin of many of the Victorian granites, and, if so, will probably fully account for the otherwise inexplicable and anomalous physical relations of these rocks.

The upper members of the lower palæozoic or silurian epoch first appear a few miles westward of Melbourne, and extend in great undulations eastward to the meridian of Wilson's Promontory, beyond which, to the east,

no upper silurian fossils have been detected; east of the Snowy River, near Delegete, where the more slaty structure, characteristic of the lower beds, commences again, the double graptolites reappear as the only fossil.

Melbourne stands on rocks consisting of soft yellowish and brown sandstones and shaly "mudstones," with bands of dark blue or grey shale and hard fine-grained dark-blue rock, having many of the lithological characteristics of the "Ludlow Rocks" of Siluria. The fossils collected in Melbourne and neighbourhood, consisting of a large number of genera and species, examined and described by Professor M'Coy, indicate the beds as chiefly belonging to the "May Hill" sandstone group, or the base of the upper silurian.* Beds containing similar fossils have been traced 75 miles north to Heathcote, and occur at intervals to the eastward for nearly 70 miles, or to the valleys of the Aberfeldy and the Thomson, in Gippsland. In other localities within the same parallels many fossil genera and species have been collected, indicating some of the beds as equivalents of the "Wenlock" shale group, and others as probably older than the May Hill sandstones. The thickly-wooded character of the country, the scarcity of sections of the strata, the general mantle of recent superficial deposits, but above all the want of any approximately correct topographical map (without which, as Professor Whitney observes,† "accurate geology is simply impossible"), have rendered it hitherto impracticable to trace out or define, except in the most general way, the various subdivisions above indicated. A considerable unconformity certainly exists between the upper and lower silurian groups; they present differences in general lithological character and physical structure similar to those observed between the same groups in Britain. Sharp folds and contortions, a high average dip and general slaty structure, are eminently characteristic of the argillaceous beds of the lower, whereas rubbly shales or "mudstones," seldom exhibiting true slaty cleavage, and a lower average inclination, prevail in the upper groups. Only one small band of limestone (a grey marble,‡ specimen No.) has yet been discovered associated with silurian strata. This occurs in the parish of Yerring, on the Upper Yarra, and is described in the published geological report (1855-56) on the basin of the River Yarra, &c.

At Anderson's Creek, Upper Yarra, on the Goulburn, and in Gippsland, fossiliferous calcareous breccias and bands of hard grey slightly-calcareous sandstone are also occasionally met with, but a general scarcity of calcareous bands, and a prevailing siliceous and aluminous character, are marked features of the whole of the Victorian silurian series.

Excellent flags for street paving, roofing slates of fair quality, and occasional beds of good freestone for building, are procured from the lower palæozoic (silurian) formation; also abundance of excellent brick earth and clay suitable for the manufacture of pottery, already an important industry in some of the inland towns. The flags are deserving of especial notice, as they are now generally used, and have superseded the Scotch flagging, at one time largely imported. The slate quarries are not yet fully developed, and the slates hitherto sent to market have not been sufficiently good, or

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* Specimens are exhibited of fossils collected from the rock excavated for the Exhibition building.

† *Geological Survey of California*, vol. I., page 7, Introduction.

‡ Vide analysis No. 11.

raised in sufficient quantity, to exclude or even to compete with those imported. The building stones have hitherto only been used locally where "bluestone" basalt was not available. At Castlemaine and Sandhurst a soft brown freestone has been used to a small extent; but the uncertainty of obtaining it free from soluble salts, with which it is constantly more or less impregnated, rendering it liable to rapid exfoliation and decay, will always prevent its general adoption for building purposes.

Quartz occurs throughout the lower palæozoic rocks in veins, "dykes," or "reefs," from the thickness of a thread to 130 feet. They have generally a nearly-true meridional direction, and are inclined at all angles either east or west, are often vertical and sometimes horizontal; occasionally they coincide with the planes of the strata, more frequently with those of cleavage or joints, and often they intersect all.

These veins traversing lower palæozoic strata and associated with granitic and igneous rocks are, so far as is at present known, the primary source of the whole of the gold raised in Victoria. No better illustration of the number and importance of these veins could be given than is afforded by the published quarter-sheet maps of the Geological Survey.

Nos. 9.—N.W., N.E., and S.W.—Taradale, Langley, Holcombe.
,, 13.—S.W. and S.E.—Elphinstone and Barfold.
,, 14.—S.E.—Castlemaine.
,, 15.—N.E. and S.E.—Guildford and Yandoit.

Each of the above maps embraces 54 square miles of country, the physical features of which have been very elaborately surveyed and drawn, and on which every reef and gully has been laid down, whether known to contain gold or not.

The thickest and most persistent veins or "lines of reef" are found in the lower or older portions of the series, but the average yield of gold per ton of stone has, I believe, been greater from the thinner veins of the upper beds. These latter occur near Melbourne, also at Kilmore, Yea, Reedy Creek, Heathcote, Rushworth, Jamieson's, Wood's Point, Stringer's Creek, &c. The greatest depth to which any reef has yet been worked in Victoria is about 590 feet;* stone from this depth has yielded 5 ozs. per ton.

The total area occupied in Victoria by lower palæozoic auriferous formations with their associated plutonic rocks, inclusive of districts in which the overlying tertiary and recent deposits do not exceed 350 feet, cannot be estimated at less than 41,813 square miles. Deducting 11,465 square miles occupied by granite and other plutonic rocks that are not, or only partially, auriferous, we have an area of 30,348 square miles, in any part of which there is a possibility of remunerative gold deposits being found either in veins or in alluvial deposits. The actual area mined upon is stated in the Mineral Statistics of Victoria, 1865, to be 725·641, or $725\frac{64}{100}$ square miles, and the estimated number of worked quartz-reefs 2029.

The above facts, viewed in connection with the large extent of country over which gold-bearing quartz-veins have been discovered, and the comparative limited extent of the different workings, afford good grounds for the inference that the gold mines of Victoria may, with the requisite and judicious combination of skill and capital, and lessened cost of production,

* One shaft, at the Victoria Company's mine, Clunes, is 630 feet deep. From the 444 feet level of the Port Philip Company's mine 1 oz. per ton has been obtained. Winzes have been sunk from the 550 to the 630 feet level in good quartz lode, 13 feet wide, and eastern wall not reached.

be made as permanent a source of wealth as the tin, copper, or other mines of Great Britain. A "lode" containing ores of copper has recently been discovered and opened in the valley of the Thomson River, in Gipps Land. It accompanies a diorite dyke, associated with upper silurian rocks. Some rich specimens of several kinds of ore, and also of native copper (*vide* mineral description), have been obtained from the lode. Whether the ores occur sufficiently rich and in sufficient quantity to pay the cost of extraction and carriage, is not yet proved. Several tons smelted in Adelaide are reported to have yielded 18 per cent., and the mine is now being worked on tribute. This is the only copper lode yet found in Victoria.

UPPER PALÆOZOIC ROCKS.

The above classification of the several groups of strata included in the following notice must be considered to a certain extent provisional, as, though some are certainly referable to that epoch, others may eventually have to be classed as lower mesozoic. They are chiefly developed to the westward in the Grampians, and in the Serra or Victoria and Dundas ranges, and to the eastward in a country extending from a little north of Port Albert through Ben Cruachan and Mount Wellington to the great dividing range. Other smaller patches or "outliers" occur throughout the intervening central portion of the colony—at Bacchus Marsh and Ballan, on the eastern part of the Mount Macedon ranges; on the Colibau near Kyneton; on the Wild-duck Creek near Heathcote; and on tributaries of the upper Goulburn, near Mansfield; also at Mount Tambo, on the head waters of the Mitta Mitta.

To the westward a thickness of upwards of 2000 feet is exposed in the precipitous escarpments of the Grampians, Mount Sturgeon, Mount Abrupt, and the eastern face of the Victoria Ranges. The lithological character of the series as exhibited in the Grampians is strictly arenaceous—massive thick-bedded sandstones with bands of sandy flags, but no slaty or shaly beds. Considerable varieties occur in texture and composition, from very hard siliceous grit and quartz-rock with included pebbles of white quartz (as at Mount Talbot, Mount Arapiles, and the Black Range) to hard and soft fine-grained freestones. The prevailing colours are shades of whitish-brown, reddish-brown, and white, and rarely brick-red. Much cross-stratification or false bedding is observable, but the whole formation has a general westerly dip at rather low angles, giving a gentle slope to the face of the hills in that direction, whilst to the eastward the beds terminate abruptly in bold rocky escarpments and almost vertical cliffs, several hundred feet in height. In the Dundas and Black Range the dip of the beds is reversed, or to the eastward, indicating a sinclinal axis between those hills and the Grampians, Sierra and Victoria Ranges. (*Vide* Sketch, Section plate 2.) In some places the beds are seen to rest directly on granite, whilst in others they rest on the upturned and denuded edges of the silurian strata.

At Mount Sturgeon, the southern end of the Grampians, several quarries have been opened from which freestone of excellent quality can be obtained in unlimited quantity. The cost of transport, however, from such a remote district prevents its use in Melbourne, although in many respects it is perhaps the best freestone yet found in Victoria. At one time large quantities of stone were raised from similar beds about 25 miles west of

Melbourne, near Bacchus Marsh, and used in the construction of several public buildings in Melbourne—the Treasury, the Custom House, and the Parliament Library. These buildings have now been completed about five years, and the stone has not been used since in Melbourne. In opening the quarries the beds were found to be very variable in composition, and so full of joints as to make it both difficult and very costly to obtain the stone in quantity of the uniform texture and quality required in large buildings. This has prevented its further use, and any freestone now required for buildings in Melbourne has to be imported chiefly from Tasmania.

Some of the beds afford excellent grindstones.

In several of the localities above enumerated, thick masses of conglomerate are associated with the sandstone. They occur generally towards the base of the series, and are composed of a very irregular aggregation of rounded pebbles, and occasionally angular or sub-angular fragments of all sizes of granite, greenstone, or diorite, various porphyries, hard slate, gritty sandstone, grey quartz rock, and quartz. These pebbles or fragments are imbedded either in a soft, sometimes earthy, mass, showing little or no trace of stratification, as at Darley, near Bacchus Marsh; or are interspersed in a thinly-stratified sandy shale, as at the point where the road from Sandhurst to Lancefield crosses the Wild Duck Creek. They more commonly occur in hard cemented masses, as on the Mount Macedon "conglomerate range;" in the valley of the Howqua, near Mansfield; Ben Cruachan, and the Avon River Ranges, Gipps Land; on the Macalister, near Newburn Park and Mount Tambo. From Mount Macedon eastwards, and especially near Mansfield and in the Gipps Land localities, greater variations in the general character, colour, and composition of the beds occur than is observed in the more western out-crops, and I am inclined to think that the Bacchus Marsh, Ballan, and Grampian beds are newer than any we have in the eastern districts. A few extracts from notes made at some of the localities named will afford the best idea of their general character.

Mount Tambo, about 3800 feet above the sea. Thick masses of purple quartzose grit, coarse conglomerate, and soft fine-grained yellowish micaceous shales, with numerous indistinct impressions of plants; dip south 15°, west 50° to 60°; base of Mount Tambo, on north side, all gneissose, schist, and felspar porphyry.

Avon River, above junction of Valentia Creek. We find yellow and brownish-red coarse-grained sandstones, and micaceous freestone, with numerous impressions of plants. Very good specimens of Lepidodendron* are found here; also other vegetable impressions not sufficiently distinct to be determined. These plant beds are underlaid in this locality by a great thickness of purple-red rubbly and nodular shales, interstratified with hard fine-grained purple-red or light-claret-coloured sandstones. The faces of the sandy beds are almost always covered with mica in large scales.

Near Mansfield, to the north-west, at Mount Battery, &c., precisely similar beds with impressions of plants occur, also underlaid, as on the Avon, by thick beds of coarse conglomerate. The average dip of the beds is generally under 30 degrees, and in some places, as at Guana and Moitun

* Photograph No. 1.

Creek, where they are exposed in cliffs 250 to 300 feet in height, they are quite horizontal.

On the Freestone Creek, near Bushy Park, whitey-brown freestone, with purple and dark blue and brown micaceous shales were observed; and, associated with them, greenish-coloured rubbly calcareous bands, closely resembling the "Cornstones" of the old red sandstone series, to which also the whole formation bears a striking resemblance.

The character of the conglomerate beds before mentioned near Darley, and on the Wild Duck Creek, is such as almost to preclude the supposition of their being due to purely aqueous transport and deposition. It is, however, very suggestive of the results likely to be produced by marine glacial transport; and the mixture of coarse and fine, angular and waterworn, material, much of which has clearly been derived from distant sources, would also favour this supposition. Grooved or ice-scratched pebbles or rock fragments have, however, not yet been observed.

No minerals of economic value have been found in any part of the series, neither do they present indications of quartz reefs or mineral veins of any description. Whether the cupriferous, calcareous, and slaty strata of South Australia are, as I am inclined to believe, members of the same group, is uncertain. If so, they have not yet been recognised in Victoria.

The occurrence of gold in the conglomerates, derived from the quartz veins of the silurian rocks on which they are deposited, is an interesting and still-undetermined question. Several analyses have been made of quartz taken from the conglomerates, in one instance from the section on the Werribee (Photograph No. 4) where the quartz had clearly been derived from the denuded surface of a silurian quartz vein; but neither in this nor in any other instance was even a trace of gold detected, and, as might be expected, no alluvial or other gold deposits have been discovered within any area of Victoria exclusively occupied by these rocks.

Mount Tambo, Avon River (Gippsland), Mansfield, and Bacchus Marsh are the only localities where fossil plants have yet been found, and in two only of these, Avon River and Bacchus Marsh, are the specimens sufficiently perfect to be clearly identified; from the former Lepidodendron, and from the latter Cyclopteris or Gangemopteris longifolius (M'Coy) —the former certainly palæozoic, and the latter probably triassicor lower mesozoic.

No fossils of any kind have been found in the Grampian beds, and not a trace of fossil animals in any part of the series. This apparent scarcity of fossils is probably in a great measure due only to the hitherto cursory and partial nature of the examinations that have been made; and we may reasonably anticipate that when a detailed and accurate survey is made in the districts, further and more conclusive evidence of the true age of the beds will be obtained.

The position in the series of the upper palæozoic fossiliferous limestone, previously alluded to as occurring in isolated patches in eastern Gippsland (Buchan, Bindi, &c.), has not yet been satisfactorily determined. The small patch near Bindi would, however, appear to be above the plant-bearing sandstones and conglomerates of Mount Tambo, and, if so, would indicate that the latter are older than the true European palæozoic coal measures which, so far as is known at present, do not exist in Victoria.

SECONDARY OR MESOZOIC EPOCH.

This epoch is represented in Victoria by a series of rocks (coloured brown, No. 7, on sketch-map). They occupy four distinct and separate areas, together 3982 square miles, distributed as under :—

Wannon and Glenelg	349	square miles.
Cape Otway, including Barrabool Hills and Indented Heads	1882	,,
Cape Paterson to Traralgon and Latrobe Valley	1436	,,
Welshpool	315	,,

NOTE.—All the known coal-bearing rocks in Victoria belong to this period.

Very few sections have yet been found that show clearly the relation of this "carbonaceous" formation to the older strata, on which it rests. In a few instances it is clearly seen to have been deposited on granite, the detritus of which, not much waterworn, enters largely into the composition of some of the beds. In one case, in the valley of the Latrobe near Traralgon, it is found resting on the upturned edges of the auriferous silurian rocks, and the lower beds of the "carbonaceous" formation consist of thick masses of an angular brecciated agglomerate of small fragments, apparently derived from the subjacent silurian strata.

A great similarity in general mineral and lithological character obtains throughout these rocks in the several districts. Alternating masses of hard and soft thick-bedded sandstone and argillaceous shales occur in all parts of the series, and occasionally thin bands of hard grey or brown calcareous rock are met with ; but there are no distinctive or characteristic groups of beds that would render their co-ordination possible in widely-separated localities.

The prevailing colour of the strata, especially of the sandy beds, is a dull greenish grey, occasionally passing into brown. The shales are commonly dark grey, blue, or almost black ; the latter often contain a good deal of pyrites* (sulphide of iron). Not unfrequently portions of large branches or trunks of trees are met with, horizontally imbedded. Calcareous spar occurs either in veins or forming a thin coating on the faces of the joints, and concretionary nodules of clay iron ores (carb. of iron) are also frequently found, but not in sufficient quantity to be economically valuable.

The average dip of the beds does not exceed 20°, and they are often horizontal over considerable areas.

In the vicinity of Geelong the sandstone has been extensively quarried, and used in the construction of most of the larger public and private buildings in that city. The English, Scottish, and Australian Chartered Bank, in Elizabeth-street, Melbourne, is also built of freestone from the same formation, quarried at Griffith's Point, on the east side of Western Port Bay. Like the upper palæozoic freestones from Bacchus Marsh, these also are found to be locally much impregnated with saline matter, which, on exposure to the weather, effloresces on the surface of the stone, causing rapid exfoliation and decay.

The character of the strata generally indicates that they have been

* A small sample of this pyrites assayed at the Geological Survey laboratory yielded gold equal to 6 dwts. 18 grs. per ton.

formed in shallow water, under the influence of strong and constantly-varying currents, giving rise to much diagonal and wedge-shaped stratification or "false bedding."

In Mr. Wilkinson's report on the character of the formation in the Cape Otway district, published last year, he says:—"The cliffs along the coast to the Parker River are entirely composed of 'carbonaceous' sandstones and shales. There are many interstratified, coarse, gritty beds, composed wholly of granitic detritus; also beds of variable thickness of pebble-conglomerate, the pebbles consisting of granite, syenite (like that of Gabo Island), various kinds of porphyry, dark metamorphic slate, and mica schist."

"These beds are very similar to the conglomerate of the Barrabool Hills, in which I found lower silurian graptolites contained in rounded pebbles of dark slate. Numerous small coal-seams crop out on the coast and in the ranges. The largest I have seen, about a mile up the Wild Dog Creek, is less than a foot thick. The dip of the strata is very inconstant throughout the district; this, and the fact of their being much faulted, renders it almost impossible to ascertain, even approximately, the thickness of the series. The sandstones are very variable in colour and texture. Some of them, however, are very durable, as shown by that used for the Cape Otway light-house, built in 1848, and in which the chisel marks, even on the steps, are only slightly effaced. A peculiar characteristic of nearly all the sandstones of this formation is the embedded concretionary spherical or cylindrical nodules, which vary from the size of a nut to that of a foot or more in diameter. Sometimes they are many feet in length, and appear like parts of the branch or trunk of a tree. They are generally calcareous or ferruginous, and harder than the enclosing rock. Often distinct lines of stratification are continued through them from the main rock. In many places there are high exposed coast cliffs containing numbers of these concretions, which, owing to their superior hardness, stand out in relief on the weathered face of the cliff, or on the surface of a jutting ledge of rock, presenting a very remarkable and picturesque appearance."

Very similar characters were noticed in the Cape Paterson beds, and described in my first report (published December, 1853) on the "carbonaceous" or coal-bearing rocks, thus:—

"The general lithological character of the strata may be briefly described as follows:—A series of thick-bedded rather soft coarse and fine grained very felspaltic sandstones, grits, and brecciated conglomerates of various shades of brown, yellow, and greenish-grey, dependent on the state of oxidation of the iron forming the colouring matter. These beds are apparently formed from the detritus of granite and trappean rocks, and often contain fragments of felspar crystals. The weathered faces of the beds present everywhere a network of veins composed of hard sandy ironstone or carbonate of lime, as well as numerous large and small ferruginous sandy nodules and conactions. These veins and nodules, being much harder than the surrounding rock, have resisted the denuding action of the atmosphere and the waves, and are now left standing out in all directions, giving the beds a very rough, uneven, and fractured appearance."

At one point of the Cape Otway coast, between Cape Patton and Loutit Bay, these spherical nodules are very remarkable, presenting an appearance as if a shower of cannon balls had fallen on the face of the beds.

As in the Cape Otway district, so in all the other districts occupied by this formation, seams of coal have been found. Apparently they are not confined to any particular part of the series, which is, I believe, at least 5000 feet in thickness.

The quality of the coal varies greatly. Ordinary brown coal, bright jet coal that will not soil the fingers, and good bituminous coal have all been observed. The "brown coal" character is, however, by fat the most prevalent, the good bituminous seams are rare, and no anthracite has yet been found. The thickest seam discovered does not exceed four feet. This, with other thinner ones, is situated on the coast at Cape Paterson, midway between Port Phillip Bay and Wilson's Promontory. They dip southerly, or seawards, and consequently crop out at a short distance inland, thus occupying a very small area, which is still further reduced on the east by a large fault, and on the west by curves in the strike of the beds. In attempting to follow any of the Cape Paterson seams on the strike they they are found either to thin out, split up into small bands, or terminate abruptly, often, however, reappearing in about the same geological horizon, and thus forming small, irregular cakes and patches rather than persistent beds. This is apparently due to the drifted origin of the greater part, if not of all, the vegetable matter now forming the coal. No "underclay" is seen, and sandstone or a sandy bed commonly forms both floor and roof of the seams. Many other seams are known in different parts of the same and other districts, but few, if any, are so much as 20 inches thick, and generally of inferior quality, which, combined with their unfavourable position as regards transport, preclude the possibility of their being profitably worked.

The Cape Paterson seams were first discovered in 1828, either by Hovell or Hume. Attention was again directed to them in 1849 and 1852, since which time a very large sum has been expended, both by the Government and through private enterprise, in endeavoring to develop them, but only 1900 tons of coal have yet been brought to market. Numerous shafts and bores have been sunk, many of them in the most unlikely places, and some through strata the whole of which are exposed in natural section. The deepest bore in the Western Port District is now over 800 feet, and it is proposed to continue it to 1000 feet, though not a single seam of coal has been cut in the depth already reached. Two other bores, of 400 feet each, have been made in the same district during the past year, with a similar result; and a like unsuccessful result has attended all the attempts to find workable coal in the Geelong, Cape Otway, Welshpool, and Portland districts, though in the first-named locality several deep sinkings have been made, and the last bore at Geelong has been carried down 1020 feet. The foregoing facts tend strongly to confirm the opinion expressed in the report of 1853, previously quoted, viz., "that if thick and extensive seams existed, they would have to be sought by deep sinking into those portions of the formation that are not exposed at the surface; the seams that are exposed, being clearly only very limited in extent and very variable in thickness." The advice then given has not been acted on, and unfortunately the deepest bores hitherto made have been chiefly through portions of the formation that could be examined in natural sections, and which therefore afforded no hope of success except to the sanguine and doubtless skilful, but unscientific, practical miner.

The only fossil animal yet discovered in any part of the Victorian "car-

bonaceous" or coal-bearing rocks is a species of Unio,* found in 1859 whilst sinking for coal in the Wannon district. Several specimens were then collected from a soft greenish-grey sandstone, overlying thin seams of carbonaceous matter more resembling lignite than true coal. Specimens of Sphenopteris, Pecopteris, Zamites, and Tæniopteris are found in the same beds, as also in all the other districts in which the coal rocks occur. Mr. Wilkinson states in his report on the Cape Otway district :—"The sandstones and shale nearly always contain markings of leaves, stems, &c., and fragments of carbonised wood, but very few of the leaves can be distinctly made out. The most perfect are of Zamites, Tæniopteris, Daintreei, and Sphenopteris. The two latter are very abundant; in fact, the coal seam in the Wild Dog Creek seems to be wholly composed of this Sphenopteris." Associated with them in the Cape Paterson district, one or two fragments of Phyllotheca have been detected, but neither Glossopteris, Browniana, nor Vertebraria, so common in New South Wales coal beds with Phyllotheca, have yet been found in Victoria, nor, I believe, Zamites or Tæniopteris in New South Wales.

From the foregoing, together with other independent geological evidence, I am inclined to believe that the Victorian "carbonaceous" series is newer than and above the "Sydney sandstone," and may perhaps represent some part of what Mr. Keene designates in his paper on the coal measures of New South Wales (published in the quarterly journal of the Geological Society, May 1865, No. 82) "false coal measures" (Wyanamatta beds of Clarke). In any case, all the evidence hitherto obtained, both palæontological and geological, tends clearly to show that the "carbonaceous" or coal-bearing rocks in Victoria are newer than palæozoic, and that a great break and unconformity exists between them and the beds that contain Lepidodendron and other palæozoic plants in eastern Gippsland, &c.

The physical character of the districts in which the mesozoic carbonaceous rocks occur is very varied. In some there are densely-timbered and precipitous hills and valleys, in others fine undulating downs clothed with rich grass and scarcely any timber, or low flat country covered with varieties of coarse grass, heather, grass-trees, stunted gums, and clumps and patches of gum scrub. This latter character is, however, due to the presence of overlying newer tertiary deposits, that commonly form a poor, sandy soil. Where they are not so overlaid, the soil is generally deep and exceedingly fertile, as on the Barrabool Hills, in the valley of the Wannon, and in parts of the Western Port and Cape Otway ranges. As timber-producing districts, and in variety of vegetation, the two last-named are probably unsurpassed by any in the colony. The blue-gum and stringy-bark (*Eucalyptus Globulus* and *E. Obliqua*), the blackwood (Acacia *Melanoxylon*), the native beech or myrtle (*Fagus Cunninghami*), and the wattle (*Acacia dealbata*), all grow in profusion and of great size; and, together with the dense undergrowth of smaller trees, shrubs, and ferns, amply testify to the richness and fertility of the soil. During the progress of the geological examination in the Cape Otway country, Mr. Charles Wilkinson discovered two species of fern, not before known in Australia. He states :—"One of them, *Cyathea medullaris*, is a gigantic

* This fossil has been named Unio Dacombii, by Professor M'Coy, and he considers it to be quite distinct in generic characters from the so-called Unio from the palæozoic coal beds, and more nearly to accord with the recent type of Unio.

tree fern ; the tree I obtained my specimen from was 51 feet high ; this, I am informed by Dr. Mueller, is common in New Zealand, and it is also found in New Guinea, Norfolk Island, and some of the Pacific groups. The other (*Aspidium hispidum*) is a fern not found hitherto out of New Zealand."

TERTIARY, OR CAINOZOIC, AND RECENT PERIOD.

The rock formations of the tertiary, including the recent, period, whether regarded in their economical, physical, or geological aspects, occupy by far the most prominent place in Victorian geological history.

Strata of sedimentary or volcanic origin, referable to some section of tertiary or recent time, occupy probably fully one-half, or over 40,000 square miles, of the surface of Victoria. They are found resting unconformably on all the older formations, igneous and stratified, and range from sea level to elevations of over 4000 feet. They include groups of strata of earth, loam, sand, clay, gravel, conglomerate, ferruginous and calcareous sandstone and grits, hard quartz rock, marble, and other kinds of limestone, and various volcanic products, each of which has its more or less distinctive geological, palæontological, or mineral character, indicating it to be truly representative of the recognised eocene, miocene, pliocene, or pleistocene (including recent) deposits of Europe and other countries ; the terms being applied here, however, simply to denote lower, middle, upper, and recent tertiaries, rather than either exact synchronism with European beds or any ascertained relative percentage of living and extinct forms in their fossil contents.

The most important sections of the tertiary period in Victoria are those embracing the auriferous drifts, and the determination of the precise range of these in tertiary time is a matter of the utmost consequence as affecting the probable extent and productiveness of the goldfields. In connection with this subject the following facts and observations have recently been published as a Parliamentary paper, 8th May, 1866 ; but, considering the economic importance of the question involved, and its scientific interest, I am induced to take this opportunity of republishing it, together with some additional facts relating to the same subject.

OBSERVATIONS ON THE PROBABLE AGE OF THE "LOWER GOLD DRIFTS."

The attention of the geological survey has latterly been directed to the very important question of the age and probable auriferous or non-auriferous character of what are called the "Lower drifts of Victoria ;" and, from the facts observed, the following conclusions have been arrived at :—

First. That these particular drifts are clearly antecedent in date to the upper and middle marine miocene beds, under which they have now been traced, and, therefore, that they are far older than the lowest pliocene gravels, to which age the "deep-lead" gravels of Ballarat, the White Hills of Bendigo, and other similar rich gold-bearing gravels have been referred.

Second. That they do not probably contain gold in *paying quantity*, the reason being that they are derived from the abrasion of quartz veins that

themselves contained little or no gold, and that were probably formed by forces in operation as long prior to those which produced the gold-bearing veins as the denudations producing the barren miocene gravels were prior to those which gave rise to the pliocene productive ones.

I will now briefly state the facts which have led to these conclusions.

During the progress of the geological survey, deposits from a mere capping to over 300 feet thick have been met with in several localities, from sea level to an elevation of 4000 feet. These consist of beds of clay, sand, "cement" or conglomerate, gravel, and large boulders—the gravel and boulders much waterworn and rounded, and composed either of quartz, quartz-rock, or hard siliceous sandstone. They rest on the ordinary slates and sandstones (silurian) of the goldfields, and are often in the vicinity of rich gold-bearing quartz reefs.

Till quite recently I have considered these deposits to be true older pliocene gold-drifts, or of the same age as the rich lower drifts of Bendigo, Epsom, Ballarat, Castlemaine, and other goldfields, all of which drifts they very closely resemble, both in lithological character and geological position. Holding this opinion, I have hitherto been at a loss to explain why they had in no instance been found to contain gold in *paying quantity*. Numerous shafts had been sunk, and levels driven in them in the most likely places, in various localities, both by miners and by the geological survey parties, with a view to develop their supposed auriferous contents, but always with the same unsuccessful result.

In the neighbourhood of Steiglitz especially they occur in close proximity to rich quartz reefs, and the more recent alluvial deposits near the same reefs are also auriferous, while every attempt (and many have been made) to find paying gold in the older gravels either on the hills or in the valleys, has proved unsuccessful. The connection of these old unproductive miocene gravels of the Steiglitz goldfield with the lower gravels of the Golden Rivers, Tea-tree Creek, the Upper Moorabool, Parwan Creek, Bacchus Marsh, and Ballan has not yet been fully mapped out; but the preliminary examination recently made has, I believe, clearly established that they all belong to the same miocene period; and, if so, I venture to predict they will all prove equally unproductive. At the Tea-tree Creek, and all along the valley of the Moorabool, what is believed to be the true older pliocene gold gravel has been worked, and it rests directly on what I now term the non-auriferous miocene gravel, without the intervention of the marine beds, or of the older basalt, both so well shown lower down the same valley. The section near the Golden Rivers is:—

1. Upper basalt rock, about 25 to 30 feet.
2. Pliocene gravel, about 50 to 60 feet.
3. Miocene gravel, &c. ("false bottom of miners"), gravel, sand, clay, and boulders, with fossil leaves and wood, about 400 feet.
4. Silurian slates, &c.

The section on the Moorabool, west of Steiglitz, is:—

1. Upper basalt, 40 feet.
2. Sandy pliocene grit, 10 to 15 feet.
3. Upper coralline limestone (miocene), 13 feet.
4. Older basalt, enclosing bands of hard compact limestone, with fossils .... } Miocene.
5. Sandy limestones, with fossils, 30 feet .... }
6. Rounded quartz pebble drift, and hard siliceous conglomerate rock, with fossil wood, lower part a gravel and boulder drift, 90 feet.
7. Silurian slate and sandstone with quartz veins.

No. 6 of this section represents No. 3 of the Golden Rivers, 3, 4, and 5 being absent in the latter. The thicknesses given are only approximate, and of course vary in different sections.

In support of the theory advanced respecting the non-auriferous character of a set of what are believed to be the older quartz veins, and from which the miocene gravels have probably in great part been derived, I would mention a fact well known to all experienced quartz miners, viz., that in many districts numerous large lines of reef occur that are entirely barren, though in close proximity to others affording handsome returns. These reefs present no peculiar features either in external character, general appearance, or mode of occurrence that would enable an ordinary observer, unacquainted with the reefs of the district, to distinguish them. They are, however, I believe, recognised without much difficulty by the practical quartz miner.

Now, unless there really is, as suggested, some marked difference in the time, and also in the conditions, under which these different reefs were formed, it is difficult to explain why one reef should be richly auriferous, while another, in close proximity, is entirely barren, if formed at the same time and under similar conditions. In attempting to reconcile these facts, I have arrived at the conclusion that there must be two, if not more, distinct sets of quartz veins; that the older ones were formed prior to the miocene period, and are barren; and that the newer ones were formed after the close of the miocene epoch, and before the pliocene, and are productive. The former have furnished the material for the barren miocene gravels, and the latter have furnished the material for the productive pliocene gravels.

The four sketch-sections, plate 3, show the relative position in different places of the upper and lower drifts, or pliocene and miocene, referred to.

In the Ballarat Valley, section 1, the pliocene deposits are largely developed, and there are four separate streams of upper or pliocene basalt, the miocene beds with their associated older basalt and marine beds being absent.

In the Moorabool Valley, section 2, on the south side, the whole of the beds are present; but the pliocene series is represented by only one layer of basalt and one thin bed of gravel, and the miocene beds are over 200 feet thick. On the north side of the valley, same section (2), the pliocene gravel rests on the miocene gravel (6) with no basalts.

At the Tea-tree Creek, section 3, we have the same as above, but the upper basalt covers both.

In section 4, Ballanee, we find upper basalt (1) on pliocene auriferous gravel (2) resting on lower miocene basalt (4), and here this latter has evidently attained a very great thickness, if indeed we have not at this point the actual core or fissure through which it has come to the surface. The Ballanee Company's bore is, I understand, now 200 feet deep, and still in this rock.

Since writing the foregoing, several careful assays have been made of quartz pebbles from the miocene gravels, without having detected a trace of gold; and also a considerable amount of "prospecting" has been done, with a similar result. In one case the pebbles submitted to assay were coated with brown oxide of iron. This was carefully separated from the quartz, and on assay was found to contain gold equal to 3 dwts. 6 grs.

per ton, thus conclusively showing a chemical deposit of gold in some post-miocene tertiary time.

No beds whatever containing marine fauna are known in Victoria overlying alluvial or drift gold deposits. That there are rich gold drifts, the result of at least three distinct periods of deposition, is quite certain; and it is now almost equally certain that the earliest is not older than pliocene, while the newest is probably chiefly due to causes still in operation. In accordance with this view, and for the sake of convenience, these three auriferous deposits have been provisionally classed as older pliocene, newer pliocene, and post pliocene (including recent)—or lower, middle, and upper drifts—coloured respectively on the geological maps yellow, red, and green; the same classification and colouring being also used to denote deposits, whether marine or fresh water, supposed to belong to the same age, though not auriferous or derived from auriferous rocks. The three stages of drift sometimes occur in the same locality without the intervention of any volcanic rocks, in which case three auriferous "bottoms," or gold-bearing strata, are found in one shaft. In some instances, as in the Ballarat Valley, the oldest auriferous formation is made up of successive layers of volcanic and sedimentary material, that gradually fill up the old valley and overlap each other, forming gold drift deposits, or "washes," at various elevations, which are certainly not the result of purely fluviatile action. In following the "leads" they are invariably found to deepen in the general direction of the present surface watershed. Thus, at Ballarat, and other goldfields on the south side of the dividing range, they deepen in a southerly direction, whilst at Clunes, Bendigo, &c., they invariably deepen in the opposite or northerly direction. This fact has given rise to the supposition, manifestly absurd, that the Ballarat and other deep "gold leads" will have a continuous fall till they eventually reach the present sea coast, in the same manner as existing surface drainage channels. Now, as the gravels containing the gold deposits are much younger than any rocks resting on the silurian along the present sea-board, it is clear that they cannot pass under the latter, which they must do to reach the sea as suggested. The facts appear to be that the deposits of pliocene age, of which the gold drifts are a part, have now a far wider surface range than the older marine tertiaries that now fringe the sea-board and probably underlie a great part if not the whole of the lower Murray plains; that they have overlapped the lower and older; and that, though they are richly auriferous when chiefly derived from, and resting directly on, the silurian rocks, they gradually cease to be so when they become underlaid by rocks newer than silurian; and thus the points at which the respective leads will die out and become unprofitable, will probably be determined by the position in the several districts of such lines of junction. As regards the leads of Ballarat, and other southern and western goldfields, the points will probably be found to be roughly along a line where the old slate or "bed rock" bottom is not more than between 600 or 700 feet above the present sea level, which in this district will mark approximately the boundary of the marine miocene tertiary beds at the epoch of the deposition of the older pliocene drifts.

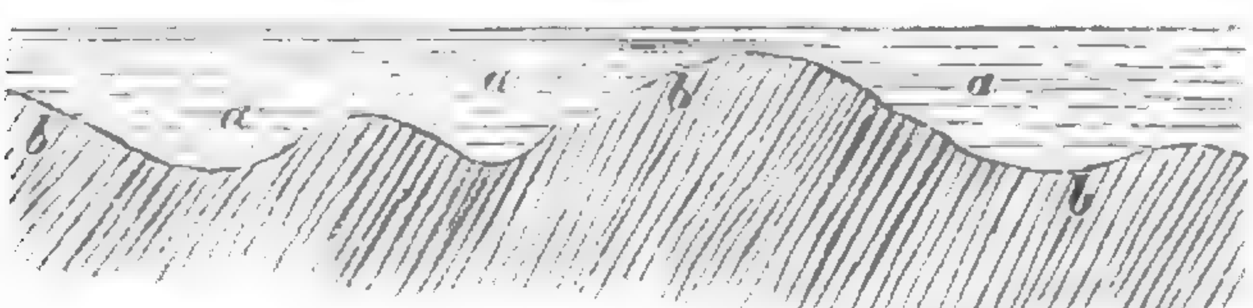
Respecting the goldfields on the northern slope of the coast range, Sandhurst, Rushworth, Dunolly, Avoca, &c., there are no data at present from which to determine the points at which the older gold leads of those dis-

tricts are likely to die out or become unprofitable in their course towards the Murray. Up to the present time, however, I believe they have in no instance been followed or found at lower levels than above named, and it seems probable that similar causes will affect them on both sides of the coast range.

The absence, before alluded to, of marine, and the prevalence of terrestrial remains, occurring as they do in the lowest beds of the series, or where they rest on the bed rock that was once the old land surface, seems rather to indicate that such land surface, on which plants and animals lived and died, and considerable masses of loose material had accumulated, existed prior to the submergence, than that the deposits that now cover those relics are solely the result of fluviatile or other sub-aerial influences. And the absence of any evidence of marine life may probably be fully accounted for by the character of the deposits, which indicate physical conditions that must have been highly unfavourable to the development of animal life in the area; while the wide spread of the formation over hill, plain, and valley, its uniform character, and the peculiar rounded and water-worn nature of much of the material composing it, are features that appear to require for their production some cause, having a much more extended, uniform, and powerful action than can well be ascribed to river floods. That very considerable areas, now forming dry land in Victoria, have been submerged in late tertiary times is unquestionable; and I believe that most, if not all, the older gold gravels, if not absolutely due to such cause, have at least been subjected to its influence, and in that sense must be regarded as marine deposits.

The greatest thickness of these older gold deposits with their associated beds of lava or "bluestone" does not exceed 400 feet, but they vary very greatly in this respect within short distances, and especially where the old surface was most uneven, as shown in Fig. 2, where *a a a* represents the tertiaries and *b b b* the older beds on which they rest.

Fig. 2.



Referring to the extent and position of what appear to be lower members of the middle or older tertiary, it has been stated (*ante* page 20), that such deposits, waterworn gravels, &c., have been met with in several localities, from sea-level to an elevation of 4000 feet. Now, supposing the determination of the probable age of these deposits to be correct, and also that they, like the upper gold gravels, are not due to merely fluviatile action, it follows that portions of the surface of Victoria have been raised at least 4000 feet since the commencement of miocene tertiary times. Whether the same area has ever again been completely submerged is a question in tertiary physical geology that will yet require much careful investigation before any definite conclusions can be arrived at. At present I am inclined to believe that no such entire submergence has taken place, and though the tertiary fossil fauna and flora indicate, as in Europe, a gradually-cooling climate, no evidence has been found in Victoria of the intense cold of the

glacial period of the northern hemisphere, or that the climate has in earlier times been colder than it is now.

No tertiary deposits containing marine fossils have been found at a greater elevation than about 600 feet above the sea. The oldest beds, probably upper eocene (oligocene), occur on the east shore of Port Phillip Bay, resting on granite and mesozoic carbonaceous rocks. Very fine collections of fossils, now in the National Museum, have been procured from them. The beds are chiefly composed of blue clays and marls with septarian nodules and selenite, and generally closely resemble the eocene strata of the Hampshire and London basins. From the western boundary of the colony to the east shore of Port Phillip Bay the marine tertiaries, chiefly miocene, are well exposed in the coast cliffs and river banks, and sometimes are found, as at the Muddy Creek, near Hamilton, upwards of 40 miles inland. Between Wilson's Promontory and Cape Howe, the eastern boundary of the colony, they occupy a long strip of coast country, nowhere, however, exceeding sixteen miles in width, and form cliffs on the northern shores of the Gippsland lakes, and on some of the rivers flowing into them. None of the lower beds have been recognised east of Wilson's Promontory, and I believe I am correct in stating that no tertiary beds whatever containing marine fossils have been recognised in any part of New South Wales east of Cape Howe.

IGNEOUS ROCKS.

PLUTONIC, VOLCANIC, AND METAMORPHIC.

1. *Plutonic Rocks (Hypogene), Granite.*—Rocks of this class occur in great variety, and the manner of their distribution would seem to indicate the probability of their existence at no great depth beneath the entire surface of Victoria.

They are, I believe, without exception, of later date than the close of the lower Silurian period; but there is no evidence of any being younger than those formations classed as upper Palæozoic or lower Mesozoic.

Their exposure at the surface is entirely due to denudations that have removed the once superincumbent strata; and in most cases no other conclusion can be formed than that they are not irrupted "masses," but only completely altered sedimentary deposits, or what Sir William Logan classes as "indigenous," as distinguished from "exotic" or intruded rocks. The slaty beds are invariably more or less altered in character for variable distances from the granite, and occasionally what appears to be a gradual change from slate into mica schist, gneiss, and granite is observable. Syenite and syenitic or hornblendic granite are also occasionally met with; also, pegmatite, or a variety, very coarsely constituted, of orthoclase, quartz, and silvery-white mica.

In the steep hilly country east of the Snowy River the relation of the granite to the older rocks is well exhibited. The beds of the creeks and bottoms of the valleys are all granite, and the tops of the ranges vertical Silurian slates and sandstones, so that on an accurately constructed geological map of the district the boundaries between granite and slate would form contour lines, much the same as in deeply eroded oolitic or other nearly

horizontal strata. Occasionally, the Silurian rocks dip at high angles off the granite; but, so far as I have observed, this relation is purely accidental, and occurs only when the line of junction happens to coincide with the normal more or less meridional strike of the stratified rocks. Quite as often, the dip is either directly on to or against the granite, or the beds are vertical and end abruptly along a granite boundary that runs at right angles to the strike of the Silurian strata. And it appears as if the origin of the granite had no influence in determining the direction or the amount of the disturbances that have affected the older rocks; which I conceive could hardly be the case had it been intruded or irrupted, whether in a fluid, viscous, or solid state, in such large masses as exist in all parts of Victoria.

It does not occur along any defined axis or line, nor has it apparently any physical connection with the main geographical axis of the country, but forms more or less isolated groups of hills, such as Station Peak, Mount Eliza, Arthur's Seat, Wilson's Promontory, &c., on the south, and Mount Alexander, Mount Tarrangower, the Terricks, Mount Korong, Mount Cole, Mount Beckworth, and others on the north.

The physical aspect of the granite areas varies considerably in different districts, apparently mainly dependent on geographical position. At the higher elevations, and also generally on the south side of the coast range, the rock is often covered with a deep soil supporting a dense and varied vegetation, as at Sealer's Cove, about the sources of the Latrobe and the Bunyip Rivers, Mount Disappointment, &c.; whereas in all the localities to the north previously named, as well as many others, it forms rather poor, hilly or gently undulating country, thinly timbered with gum (eucalypti), she-oak (casuarina), wattle (acacia), cherry (exocarpus), and honeysuckle (banksia), the she-oak and banksia being very characteristic of these districts, as they are of light sandy soils generally.

The most common mineral character observed is a ternary compound of quartz, white or pinkish (orthoclase), felspar, and black or white mica in variable proportions, forming either a coarse and friable or a hard and fine-grained rock. In some districts, black tourmaline, often in large crystals, is also a common constituent mineral, but does not replace the mica. The very frequent friable condition of the surface of the rock causes it to weather on the flanks and summits of the hills into picturesque piles of stones, like huge boulders, or into the gigantic isolated rounded pillar-shaped masses known as Tors in Devon and Cornwall, and generally characteristic of granite country. On the Coliban River and in other places, the granite is traversed by two systems of parallel joints nearly vertical, giving it the appearance of a thick-bedded stratified formation; and the idea has sometimes suggested itself, whether these divisional planes may not possibly represent original planes of stratification, their frequent coincidence in strike and dip, with the adjacent unaltered silurian rocks, lending strength to this idea. In almost every district it affords good durable building stone, but, being more costly to work than "bluestone" or basalt, it is not generally used, except for special purposes or where neither "bluestone" nor good freestone is available.

Quartz in veins is occasionally found traversing the granite, and some of these veins have proved to be auriferous. Dykes, from a few inches to many yards in width, of a very fine-grained granite or elvanite (chiefly felspar and quartz), are also very common, but no metalliferous deposits have been found associated with them.

FELSPAR, QUARTZ, AND CLAYSTONE PORPHYRY, FELSTONE, DIORITE, DIABASE, ETC.

Rocks referable to one or other of the above species occur throughout the silurian area, and also associated with the Grampian sandstone series, either as dykes filling narrow fissures or as intruded masses. They are probably more recent than most of the granite rocks, though occasionally a gradual passage is observed from one to the other. The largest area in Victoria occupied by rocks of this class is that west of, and parallel to, the course of the Snowy River. Another somewhat-similar mass, though of much smaller extent, occurs in the valley of the Wannon, near Hamilton. The Dandenong Ranges, Mount Juliet, Mount Arnold, &c., on the Wood's Point road, and Mount Macedon and Dryden's Rock, are chiefly composed of varieties of felspar and quartz-porphyries.

The stratified rocks with which they are associated are generally a good deal hardened, and otherwise altered in character, near the points of contact, commonly assuming a jaspery or flinty appearance, but never, so far as I am aware, the micaceous or gneissose character which they do when in contact with all the larger granite masses. Sometimes no alteration whatever appears to have taken place, and we find soft earthy slates containing well-preserved graptolites in immediate contact with the intrusive rock. Such a case occurs near Guildford, and is described on the quarter-sheet map of the survey 15 N.E.

Near Bacchus Marsh, on the Werribee River, at Heathcote, and on the Back Creek (quarter-sheet 51 S.W.), interesting dykes occur. In the last-named the rock consists of a whitish rather-earthy felspathic base, thickly studded with double hexagonal quartz crystals, about the size of small peas, and orthoclase felspar.

Hornblendic rocks, greenstone, diorite, diabase, &c.,† though not exclusively confined to, may at any rate certainly be regarded as characteristic, in Victoria, of strata younger than lower silurian. The most interesting dykes of this nature occur traversing rocks probably equivalents of the lower portion of the upper silurian, in the Wood's Point district, and also in the valleys of the Thomson and Latrobe, in Gippsland. At Wood's Point, Raspberry Creek, &c., they are often quite decomposed into a soft reddish-earthy rock, and this is intersected by bands and layers of quartz richly auriferous, as at the celebrated Morning Star Hill, Wood's Point, and other "claims" on Gaffney's Creek, Raspberry Creek, &c. On the Thomson, native copper and copper ores are found, accompanying similar diorite dykes. The auriferous quartz veins seem generally confined to the decomposed portions of the dykes; and this decomposition appears to be very local and irregular even in the same dyke, which in some parts is completely decomposed from the surface to 100 or 150 feet down, while in others it shows no sign of decomposition, and is as solid and crystalline on the surface as below. Plate IV. is a drawing to scale of a measured section taken in a tunnel on one of these dykes, and affords a good idea of the peculiar mode in which they are traversed by the auriferous quartz layers, generally at right angles to the wall of the dyke.

† Locally termed "rotten granite."

2.—Volcanic Rocks.

BASALT, DOLERITE, AMYGDOLOID, WACKE, ASH, LAVA, ETC.

These rocks are widely distributed in Victoria, and are estimated to occupy about 6321 square miles of the surface; none of them are known to be older than tertiary. They are the result of at least two distinct periods of eruption. The first, geographically, apparently much the most extended, marked the close of the miocene epoch, while the second, commencing towards the end of the pliocene epoch, seems to have been continued into the most recent post-pliocene time.

The district occupied by the newer or pliocene volcanic formation consists chiefly of open or thinly-timbered and well-grassed country, either quite level, very slightly undulating, or gently rising towards the coast range or to the more or less isolated hills that are distributed throughout the volcanic area.

The plains are traversed by deep-cutting, winding, creek and river channels, with rocky basalt escarpments. These channels occasionally widen out into very fertile valleys, with alluvial flats, timbered with large red gum-trees (eucalyptus). The rocks, over which the basaltic lava streams have flowed, are often cut into, and well exposed in the bottoms and sides of the valleys, showing that the basalt rests indiscriminately on all the older formations—granitic, trappean, volcanic, and sedimentary. When resting on older volcanic rocks, without the intervention of any sedimentary deposits, the fact is not easily detected except by the generally greater depth and richness of the soil—a very constant and characteristic feature of the "older" volcanic rocks; and where the surface is occupied by these, the physical character of the country generally is very different from that above described. Instead of the more or less open and level plains traversed by drainage channels, with abrupt escarpments, it presents an undulating surface of rounded hills and gently-sloping valleys, evidently due to the action of long-continued denuding forces, to which the later lava streams have not been subjected. The rock is commonly covered with a deep black or chocolate soil, which often supports the rankest vegetation, as on the road from Melbourne to Gippsland and in parts of Western Port. In other localities it is lightly timbered, and forms, probably, some of the finest and most fertile agricultural land in the colony, as at Portarlington, the Pentland Hills, the Kangaroo Ground, Berwick, Cranbourne, Mount Ararat on the Gippsland road, Cape Schank, and the shores of Western Port Bay.

The mineral and lithological characters of the volcanic products of the two periods present marked similarities and differences. An irregular concentric concretionary, or polygonal jointed, structure, is eminently characteristic of the older, so much so that, though it affords any quantity of excellent road-making or railway-ballasting material, no building-stone is ever procured from it. The columnar structure is also not uncommon in both the older and newer formation. Interbedded with the harder layers are strata of a very soft, unctuous, amygdoloidal clay or "wacke," bluish, grey, brown, yellow, brick-red, or pure white. Sometimes the section exposed consists almost wholly of such clay, traversed by ferruginous veins,

and enclosing hard lumps or balls of dense-black basalt. A careful examination shows that these are only the central nuclei of large concretionary masses that have decomposed in concentric coats, and have thus formed the clay matrix in which they are enclosed. Examples of this peculiar structure are well exhibited in the cuttings through the old Flagstaff-hill, also near the Survey office and the old Exhibition Building, both of which stand on this formation covered with a thin capping of gravel, probably miocene. The Pentland Hills near Bacchus Marsh, Cape Schank, the shores of Western Port Bay, and the south coast of Phillip Island, offer, however, the best sections for studying the formation in all its aspects and varieties of structure. The solid layers are mostly a dense, dark crystalline basalt, composed chiefly of augite, labradorite, olivine, and specular iron; and, though some beds present a honeycombed or cellular structure, they are, as a rule, far more solid and dense than the recent pliocene lavas.*

These latter present a much greater variety in texture than is observed in the products of the earlier eruptions. The most common and characteristic is the well-known "bluestone," so extensively used for building purposes in Melbourne and throughout the volcanic area. It is a true dolerite lava, a variable mixture of augite, labradorite, iron, and carbonate of lime, and presents an infinite variety of texture, often very porous and vesicular, or honey-combed, or coarsely crystalline and granular, or close grained, and not unlike a hard calcareous or metamorphic sandstone. Olivine, specular iron, hyalite, and other minerals are associated with it, though not as component portions of the stone. Various shades of blue-grey to almost black are the prevailing colours. It dresses easily, and can be procured in blocks of the largest dimensions ever required for architectural or engineering purposes.

In some districts it is associated with beds of regularly-stratified ashes. These are more easily quarried than the bluestone, and when first taken out the stone is so soft as to be readily sawn into blocks of the dimensions required. It hardens considerably after exposure, and for local use forms a very cheap, useful, and tolerably-durable building material. It is a good deal used in the neighbourhood of Warrnambool, Terang, &c. The Church of England at Warrnambool is partly constructed of this stone, and is probably the largest structure in which it has been used.

Scoriæ and honeycombed lavas, so cellular and light as to float in water, are frequently found on the flanks and summits of most of the cones and crater hills in the volcanic districts. No true trachyte or pumice has been found. Obsidian is occasionally met with, but not in large quantity.

Basalt is also frequently found in the carbonaceous mesozoic, upper palæozoic, and older rocks, occurring in injected bosses and in dykes, varying in thickness from a few inches to many yards; sometimes in the older rocks these dykes are accompanied by quartz-veins occupying the same fissure as the basalt, which apparently never exercises a metamorphic influence on the adjacent strata. Faults or dislocations of strata frequently accompany the dykes, but whether the injection of the lava was subsequent to the occurrence of the faults, or caused them, has not been hitherto satisfactorily determined.

* Many interesting minerals have been found associated with the volcanic rocks; but as they are fully described in that portion of the paper especially devoted to this subject, and written by my colleague, Mr. Ulrich, any further notice of them here is superfluous.

Good examples of these dykes occur on the Cape Paterson coast and also near Bacchus Marsh. It is not easy to determine their age, but, from their general character and mode of occurrence, I should imagine them to belong to the older volcanic period.

The products of both volcanic periods are often contemporaneous and interstratified with the marine limestones, or with fluviatile and lacustrine sedimentary deposits, that were forming at the time of their eruption. The earlier eruptions seem generally to have taken place through long rents or fissures, of lesser or greater width, and the overflows, once connected with them probably over large areas, have been more or less removed by denudation, leaving only the cores or stalks. The newer lavas, on the other hand, have been erupted and flowed in wide-spreading sheets from points—with which the sheets are often still connected—now forming conical or mammaloid hills. In many of these very perfect central crater-basins still exist. Some are occupied by deep fresh-water lakes or shallow swampy lagoons, while others are quite dry, well-grassed and thickly timbered. Mount Gambier, in South Australia, Tower Hill, near Warrnambool (the only instance of an insular crater), and Mount Eels are examples of the former; and Mount Noorat, Mount Rouse, Mount Napier, Mount Elephant, and Mount Franklin, of the latter class. Many other mammaloid hills exist which have also probably been formed as points of eruption, but on which little or no trace now exists of a crater, their outlines having apparently been considerably modified by subsequent denudation. In some instances, it seems probable that the same hills have served as vents for the eruptions of both miocene and pliocene periods.

The light scoriaceous and cellular lava and ashes usually found near all these eruptive points, and in some of them (of which Mount Gambier and Tower Hill are good instances), the walls of the crater being formed of stratified layers of ash dipping outwards at a low angle, seem to indicate the probability that most of them were subaërial volcanic vents, forming low islands in the tertiary seas, under the waters of which the lava streams flowed and were consolidated.* Numbers of lakes, lagoons, and shallow basin-shaped depressions, with rocky basalt margins, occur over the large volcanic area west of Melbourne. Some of these (such as Purrumbete, 150 feet deep, and only about 1½ mile in diameter—Gnotuk, 300 feet deep, and still smaller—Terang and Keilambete; the banks of all of which are composed chiefly of beds of volcanic ashes) may perhaps also have been the sites of old craters, but the evidence of their having been so is by no means so clear as it is respecting the hills. I am rather inclined to think that many of them are accidental depressions due to other causes, more especially as lakes and lagoons of somewhat similar character are also abundant in the extensive level pliocene tertiary area to the north-west, where the surface shows no indications of volcanic agency. Large quantities of salt (chiefly chloride of sodium) is held in solution in the waters of some of the lakes, whilst in others in close proximity the water is perfectly fresh.

So far as I am aware, no lake having a permanent outlet by which its flood waters can escape to the sea is salt; on the other hand, some that have no such outlet are, notwithstanding, quite fresh. Many of them are very shallow, and towards the close of a dry season the water has entirely

* *Vide* appended list of volcanic hills and points of eruption.

evaporated, leaving a deposit, a few inches thick, of crystallised salt resting on black mud. There are no flowing saltsprings in the districts, though most of the pliocene tertiary well-water is more or less charged with salt, but not generally so in the volcanic areas; and it appears not improbable that the sites of most of these lakes are depressions in the surface, from which the sea-water could only escape by evaporation, after the last upheaval of the land. Thus the original amount of saline matter is retained in them and deposited by evaporation during the summer months, only to be re-dissolved by the winter rains. On the other hand, where a permanent outlet exists, accession and escape of fresh-water dissolves and carries off a portion of saline matter, until the whole has been removed. The fresh-water basins having no outlet may perhaps either be due to other and subsequent causes, or may even in earlier times have had outlets since closed, or possibly their waters may still be slowly drained through subterranean channels.

Mr. Cosmo Newbery, analyst to the survey, has recently examined the waters of several of the salt lakes, and states:—"The brines, without exception, were found to contain, besides chloride of sodium, chloride of magnesium and potassium, and sulphate of soda and lime; chloride of aluminium was also found in one. They also contained a great quantity of organic matter." Chloride of sodium, however, constitutes from 90 to 98 per cent. of the total solid contents, which in one instance amounted to one pound seven ounces per gallon, due probably to extreme concentration through a succession of dry seasons.*

* Since writing the above, Mr. A. J. Skene, District Surveyor, informs me that he knows several lakes, the waters of which are quite fresh, that have outlets into swampy lagoons, and that the latter have no outlets and the waters are quite salt.

LIST OF LAKES AND THEIR APPROXIMATE AREA.

Position.	SALT. No.	SALT. Name.	SALT. Sq. Miles.	BRACKISH. No.	BRACKISH. Name.	BRACKISH. Sq. Miles.	FRESH. No.	FRESH. Name.	FRESH. Sq. Miles.
COUNTY of GRANT	1	Modewarre	2				2	Wurdee Boluc	[illegible]
								Gherang Gherang	[illegible]
		Korangamite	70	8	Longlake	8	18	Smal. Lakes	2
		Beeac	3		2 small Lakes	[illegible]			
		Cundare	2						
COUNTY of GRENVILLE	47	Weering	2						
		Ondit	1						
		Murdeduke	7						
		32 east of Korangamite	10						
		9 in parish of Mirnee	1						
		Gnarpurt	16		Wirranganuck	8		Terang	1
		Gnotuc	2		Terangtam	1[illegible]		Conewarren	1[illegible]
	33	Keilambete	2		Koreetnung	2	15	Konnendbar	[illegible]
		30 small Lakes	8		Timboon	8		Kolora	[illegible]
COUNTY of HAMPDEN				21	Bookaar	2[illegible]		11 small Lakes	2
					Bullen Merri	2[illegible]			
					Tooliorook	2			
					14 small Lakes	4			
	3	Small Lakes east of Korangamite	1					Colac	12
COUNTY of POLWARTH							4	8 small Lakes	1
		Goldsmith, and a small Lake	3					Boloke	6
	20	10 small ones near Boloke	2					Buninjon	1
		8 north of Wickliffe	1					Horse Lagoon	[illegible]
COUNTY of RIPON							9	White Stone Lagoon	4[illegible]
								Burrumbeet	12
								Learmonth	8
								8 small Lakes	1
								Purrumbete	2[illegible]
							2	Elingamite	[illegible]
COUNTY of HEYTESBURY							1	Kororoit	1[illegible]
				2	Linlithgow	2[illegible]			
COUNTY of VILLIERS					Kennedy	[illegible]	1	Cooper's Lake	8
COUNTY of RODNEY								Lonsdale	4
		Tyrrell	66					White Lake	2
WIMMERA DISTRICT	28	Mitre Lake	3				11	Albacutya	21
		24 near Mount Arapiles	9					Hindmarsh	45
		2 near Harrow	1					7 small Lakes	8[illegible]
								Boga	2[illegible]
								Baker	[illegible]
								Garnouk	[illegible]
								Charm	2
LODDON DISTRICT							11	Bael Bael	2
								Moring	[illegible]
								Leagur	1
								4 small Lakes	1
MURRAY DISTRICT							1	Omeo	2
Total	132	Salt Lakes, containing square miles	212	26	Brackish Lakes, contng. sq. miles	37	70	Fresh water Lakes, contng. sq. mls.	147

158 Brackish and Salt-water Lakes, containing 249 Square Miles.

Extensive basaltic caves are not uncommon in the western district. One near Anderson's Hill, on the east bank of the Mount Emu Creek, south of Skipton, is especially deserving notice. It contains three large and lofty chambers, connected with each other by narrow passages. The first and largest chamber is 48 by 40 yards; the next (connected by a short narrow passage), 44 by 27 yards; and the farthest from the entrance (connected with the larger one by a passage 13 yards long) is about 27 by 15 or 20 yards. Thousands of bats inhabit these caves, hanging in clusters from the roof like a swarm of bees, and on the floor are large conical mounds of a rich brown earthy matter, containing imbedded pieces of crystallised gypsum. The deposit itself consists entirely of the excrement of the animals. The average height of the chambers is from 15 to 20 feet. No explorations have yet been made in this cave.

Another near Gisborne was explored in 1856, and large quantities of bones found in it, for particulars of which *vide* quarter-sheet map of the survey, No. 7, N.W.

NAMES AND APPROXIMATE ELEVATION OF SOME VOLCANIC CONES AND CRATER HILLS.

COUNTY.	NAME OF HILL.	Approximate Height.	Crater.	
			Lake or Swamp.	Dry.
		Feet.		
NORMANBY .. (3)	Eels	590	•	
	Pierrepoint ..	891		
	Napier	1440		
VILLIERS .. (2)	Tower Hill ..			
	Rouse	1220		
HAMPDEN .. (14)	Shadwell			
	Noorat, 505 ft. deep			•
	The Sister Rises ..			
	Game or Garooc .			
	Warrnambool ..			
	Emu			
	Leura			•
	Miningorat ..			
	Fyans			
	Anderson's Hill ..			
	Vite-Vite			
	Clarke or Elephant			•
	Myrtoon			
	Woridgil			
HEYTESBURY. (1)	Poindon			
GRENVILLE .. (7)	Kerange Moorah .			
	Great Warrior Hill			
	Gellibrand ..			
	Hesse			•
	Green Hill or Bell's Hill ..			
	Lawaluk			
	Mercer			
GRANT .. .. (6)	Mary, 8 S.W. ..			
	Duneed, 28 N.E. ..			
	Moriac			
	Buninyong ..	2452		
	Warrenheip ..	2437		
	Anakies, 19 N.E., 3 mammaloid hills, highest	1850		
BOURKE .. (28)	Beveridge Hill, 8 S.W.			
	Big Hill, 8 N.W. ..			
	Green Hill, 8 N.W.		•	
	Rocky Hill, 5 S.E.			
	Melbourne Hill, 5 S.E.			
	Hay's Hill, 6 S.W.			

COUNTY.	NAME OF HILL.	Approximate Height.	Crater.	
			Lake or Swamp.	Dry.
		Feet.		
BOURKE .. (23)	Magnet Hill, 6 S.W			
	Fenton's Hill, 6 S.E			
	Bald Hill, 7 S.E. ..			
	Kororoit, 7 S.E. ..			
	Aitken, 7 N.W. ..	1668		
	Red Rock, 7 N.W.			
	Bedding Hill, 7 N.W.			
	Compass Hill, 7 N.W.			
	Gisborne, 7 N.W.			
	Holden, 7 N.E. ..	1452		
	Sunbury Hill, 7 N.E.			
	Atkinson, 8 N.E. ..			
	Bullengarook ..			
	Cotterill	679		
	Shea Oak Hill ..			
	Aitken's Hill ..			
	Tophet			
DALHOUSIE .. (2)	Jim Jim, 5 S.W. ..			
	Green Hill, 9 N.E.			
TALBOT .. (16)	Snowdon Hill, 9 S.W.			
	Kangaroo Hill, 10 N.W.			
	Bald Hill, 12 S.E.			
	Gap			
	Greenock			
	Glasgow			
	Coghill's			
	Birch or Bald Hill			
	Moorookyle ..			
	Smeaton Hill ..			
	Forest Hill ..			
	Spring Hill ..			
	Pleasant			
	Bullarook			
	Franklin, 15 S.E. ..	2092		•
	Yandoit Hill ..			
RIPON .. .. (4)	Blowhard			
	Spring Hill ..			
	Ross			
	Mount Misery ..			
LODDON DIST.	Consultation ..			

NOTE.—The number and letters attached to some of the names of hills refer to the published geological quarter-sheet maps.

ANALYSES OF LIMESTONES, IRON ORES, AND VOLCANIC ROCKS.

LIMESTONES.

1. Limestone from near Keilor (geological survey map, 1. N.W.), composed of tertiary (miocene) fossils, colour yellow, soft—Carbonate of lime, 91·61 ; carbonate of magnesia, 0·20 ; peroxide of iron, 2·53 ; silica and clay, 5·66 = 100·00. (This limestone, when burnt, yields good building lime.)

2. Limestone from cliffs, Curdie's Inlet, white granular powdery rock (miocene tertiary)—Carbonate of lime, 84·438 ; sesqui-oxide of iron, 2·93 ; soda (carbonate), 1.74 ; alumina, 1·13 ; water, 1·518 ; silica and silicate of alumina, 7·325 ; phosphoric acid and magnesia, trace = 99·081.

3. Siliceous limestone, Fenwick's Gully, Queenscliff-road (miocene tertiary)—Carbonate of lime, 75·20 ; carbonate of magnesia, 3·00 ; silica, 15·79 ; alumina and peroxide of iron, 3·00 = 96·99.

4. Yellow limestone, from Barwon Heads—Carbonate of lime, 63·18 ; carbonate of magnesia, 0·36 ; carbonate of iron, 2·01 ; peroxide of iron, 8·33 ; silica and clay, 27·91 = 101·79.

5. Septarian limestone, Schnapper Point (eocene tertiary)—Carbonate of lime, 82·012 ; carbonate of magnesia, 1·506 ; carbonate of iron, 3·472 ; clay and sand, 10·427 ; soluble silica, 0·720 ; water, 1·809 ; organic matter and loss, 0·054 = 100·00.

6. Freshwater limestone, Coliban River, four miles from Kyneton, colour dirty white, dense, fracture uneven—Carbonate of lime, 89·33 ; carbonate of magnesia, 7·45 ; carbonate of iron, trace ; silica and clay, 3·22 = 100·00. (This limestone, when burnt, yields good building lime).

7. Limestone from the Duck Ponds (tertiary)—Carbonate of lime, 88·38 ; carbonate of magnesia, 0·76 ; carbonate of iron, 0·51 ; silica and clay, 7·02 = 96·67.

8. Limestone, from Galena Point, Geelong—Carbonate of lime, 89·50 ; carbonate of magnesia, 0·43 ; carbonate of iron, 0·72; silica and clay, 6·84 = 97·19.

9. Freshwater limestone, from Lake Boloke (tertiary)—Carbonate of lime, 42·23; carbonate of magnesia, 2·18 ; carbonate of iron, 0·96 ; silica, 30·21 ; silicates of alumina, lime, and magnesia, 16·03; water, 4·46 = 96·07.

10. Blue limestone, from near Buchan, Gippsland, (Upper Palæozoic ?) —Carbonate of lime, 87·72 ; carbonate of magnesia, 0·23 ; carbonate of iron, 2·29 ; silica and clay, 7·61 = 97·85.

11. Marble from a cave in the parish of Yering, on the Upper Yarra (Upper Silurian)—Carbonate of lime, 92·60 ; carbonate of magnesia, 0·36 ; carbonate of iron, 2·12; carbonate of manganese, 0·48; silica and clay, 3·24 = 98·80.

12. White limestone, from near Mansfield—Carbonate of lime, 54·70 ; clay, 43·30 ; soluble silica, 2·00 = 100·00.

Nos. 3, 4, 9, and 12, if occurring in quantity, may be of value in the manufacture of hydraulic cements, as they contain a high percentage of clay and silica. No. 5, the septarian limestone from Schnapper Point, analysed by the late Mr. C. S. Wood, is a sample of the stone used by the late Schnapper Point Cement Company. The percentage of siliceous matter is too low for a good hydraulic lime. Its power of hardening under water

would be considerably increased by the addition of clayey matters in such proportion as to raise the quantity of silica to about 25 per cent.

Nos. 1, 2, 6, 7, 8, 10, and 11 are limestones, which yield good building limes, and may be made into cement when mixed with the proper proportion of clayey matter. That which is best adapted for this purpose is the decomposed basalt from the older volcanic rocks.

IRON ORES.

1. Ironstone from Moonee Ponds (tertiary), contains 50.68 per cent. iron.
2. Ironstone from near Mordialloc (tertiary), contains 24·26 per cent. iron.
3. Ironstone from Western Port (tertiary), contains 38·598 per cent. iron.
4. Black ironstone gravel from Newbridge, Loddon River, contains 44·34 per cent. iron.
5. R[4] Brown iron ore from Pascoevale-road, west bank of Saltwater River, contains 46·00 per cent. iron.
6. Brown iron ore from Greenstone Range, east of Lancefield, contains 52·70 per cent. iron.
7. Iron ore from Stony Creek Reservoir, near Steiglitz, similar to Moonee Ponds.

None of the above ores occur in sufficient bodies to be profitably worked. Similar ores occur in all parts of the colony, associated with the newer tertiary formations.

BASALTS—OLDER VOLCANIC.

1. Phillip Island (decomposed), colour grey. Specimen dried at 212° Fah.; loss in weight at a red heat, 15·48; portion soluble in acetic acid, 7·35; portion soluble in hydrochloric acid, 37·45; insoluble residue (clay), 39·72 = 100·00.

Soluble portion.

$Si. O._2$	25·45	Silica.
$Al._2 O._3$	28·67	Alumina.
$Fe._2 O._3$	12·50	Iron.
Ca. O.	6·07	Lime.
Mg. O.	4·37	Magnesia.
K. O.	0·91	Potash.
Na. O.	5·32	Soda.
H. O.	15·48 = 98·77	Water.

2. Phillip Island (decomposed), colour grey. Specimen dried at 212° Fah.; loss in weight at a red heat, 8·809; soluble in hydrochloric acid, 59·131; insoluble residue (clay), 32·060 = 100·00.

Soluble portion.

$Si. O._2$	37·22	Silica.
$Al._2 O._3$	21·16	Alumina.
$Fe._2 O._3$	9·11	Iron.
Ca. O.	7·02	Lime.
Mg. O.	6·21	Magnesia.
K. O. / Na. O.	8·46	Soda and Potash.
H. O.	8·80 = 97·98	Water.

3. Phillip Island (decomposed), colour red. Specimen dried at 212° Fah.; Loss by ignition at red heat, 10·32 ; soluble in hydrochloric acid, 48·63 ; insoluble residue (clay), 58·95 = 100·00.

Soluble portion—

$Si.\ O._2$	33·24	Silica.
$Al._2\ O._3$	17·18	Alumina.
$Fe._2\ O._3$	29·46	Iron.
Ca. O.	3·12	Lime.
Mg. O.	2·08	Magnesia.
K. O.	·06	Potash.
Na. O.	1·62	Soda.
H. O.	10·32 = 97·08	Water.

4. Phillip Island, dense, black, containing crystals of olivine, soluble in hydrochloric acid, 49·18 ; insoluble residue, 50·82 = 100·00.

	Soluble Portion.	Insoluble Portion.	
$Si.\ O._2$	34·16	48·46	Silica.
$Fe._2\ O._3$	12·09	Fe. O. 16·32	Iron.
$Al.\ O._3$	23·22	8·21	Alumina.
Ca. O.	5·21	7·26	Lime.
Mg. O.	12·34	18·76	Magnesia.
K. O.	3·10	—	Potash.
Na. O.	5·28	—	Soda.
Mn. O.	0·46	trace	Manganese.
$Ti.\ O._2$	0·04	—	Titanic Acid.
H. O.	2·16	—	Water.
	98.06	99.01	

5. Phillip Island, dense, black, containing a few crystals of olivine, which were separated from the portion analysed, soluble in hydrochloric acid, 46·22 ; insoluble residue, 53·78.

	Soluble Portion.	Insoluble Portion.	
$Si.\ O._2$	35·44	54·73	Silica.
$Al._2\ O._3$	8·13	19·12	Alumina.
$Fe._2\ O._3$	31·43	6·03	Iron.
Ca. O.	5·24	10·14	Lime.
Mg. O.	17·33	5·05	Magnesia.
K. O.	trace	2·11	Potash.
Na. O.	1·40	trace	Soda.
H. O.	1·03	—	Water.
	100·00	97·18	

* The richest soils in Victoria are formed from the decomposition of the older Volcanic rocks.

BASALTS—NEWER VOLCANIC.

1. Parish of Tylden, east bank of the River Coliban, dense, black, conchoidal fracture. Five per cent. soluble in hydrochloric acid.

	Soluble Portion.	Insoluble Portion.	
$Si.\ O._2$ . .	34·80	63·39	. Silica.
$Al._2\ O._3$ . .	38·58	16·11	. Alumina.
$Mn.\ O.$ . .	trace	1·01	. Manganese.
$Fe._2\ O._1$ . .	18·07	10·03	. Iron.
$Ca.\ O.$ . .	7·12	5·26	. Lime.
$Mg.\ O.$ . .	trace	3·41	. Magnesia.
$K.\ O.$ . .	—	} 2·21	. Potash.
$Na.\ O.$ . .	—		. Soda.
$Ti.\ O._2$ . .	—	0·63	. Titanic Acid.
$H.\ O.$ . .	1·43	—	. Water
$Cu.\ O.$ . .	—	trace	. Oxide of Copper.
	100·00	102·05	

2. Dark crystalline rock from the Leigh Grand Junction Company's shaft, 24 per cent. soluble in hydrochloric acid.

	Soluble Portion.	Insoluble Portion	
$Si.\ O._2$ . .	35·44	54·78	. Silica.
$Al._2\ O._3$ . .	8·13	19·12	. Alumina.
$Fe._2\ O._3$.	31·43	Fe.O. 6·03	. Iron.
$Ca.\ O.$ . .	5·24	10·14	. Lime.
$Mg.\ O.$ . .	17·33	5·05	. Magnesia.
$K.\ O.$ . .	trace	2·11	. Potash.
$Na.\ O.$ . .	1·40	0·5	. Soda.
$H.\ O.$ . .	2·03	—	. Water.
	102·00	97·68	

3. Black vesicular rock from the Barfold Company's shaft; cavities containing botryoidal masses of carbonate of lime, separated from the portion analysed; 30·19 per cent. soluble in hydrochloric acid.

	Soluble Portion.	Insoluble Portion.	
$Si.\ O._2$ . .	35·71	54·16	. Silica.
$Al_2\ O._3$ . .	40·11	19·27	. Alumina.
$Fe_3\ O._4$ . .	13·66	Fe.O. 14·08	. Iron.
$Ca.\ O.$ . .	1·07	3·14	. Lime.
$Mg.\ O.$ . .	0·52	0·85	. Magnesia.
$K.\ O.$ . .	} 6·03	7·13	. Potash.
$Na\ O.$ . .		3·24	. Soda.
$Ti.\ O.$ . .	0·72	—	. Titanic Acid.
$Mn.\ O.$ . .	—	0·28	. Manganese.
$H.\ O.$ . .	1·36	—	. Water.
	99·18	102·15	

4. Dense rock from the Barfold Company's shaft, Campaspe, quarter-sheet 13 S.E.; 32·46 per cent. soluble in hydrochcloric acid.

	Soluble Portion.	Insoluble Portion.	
$Si. O._2$	37·42	54·18	Silica.
$Al._2 O._3$	39·16	20·26	Alumina.
$Fe_3 O._4$	10·58	Fe.O. 12·43	Iron.
Ca. O.	2·03	3·32	Lime.
Mg. O.	1·52	·60	Magnesia.
K. O.	5·22	8·36	Potash.
Na. O.		—	Soda.
$Ti. O._2$	0·58	—	Titanic Acid.
Mn. O.	1·17	1·32	Manganese.
H. O.	0·98	—	Water.
	98·66	100·47	

GREENSTONE FROM GEELONG.

40·6 per cent. soluble in hydrochloric acid.

	Soluble Portion.	Insoluble Portion.	
$Si. O._2$	46·34	53·94	Silica.
$Al._2 O._3$	29·05	2·80	Alumina.
$Fe._2 O._3$	1·30	Fe.O. 11·78	Iron.
Ca. O.	14·56	14·39	Lime.
Mg. O.	3·44	16·13	Magnesia.
K. O.	4·51	—	Potash.
Na. O.		—	Soda.
Loss by ignition	1·75	—	
	100·95	99·04	

This rock is probably composed of labradorite and augite, though the silica in the soluble portion is rather too low.

MINERAL SPECIES OF VICTORIA.

In the subsequent pages I have attempted to give a list of the various minerals which have up to the present time been observed in Victoria, and to state what is known about their modes of occurrence, special characters, and associations, together with the results of experiments and analyses made in the laboratory of the Geological Survey. As the time for the preparation of this list has been very limited, doubtless many defects in the descriptions will be observed, and perhaps also some omissions of mineral species that have been found in the colony and specimens of which may be in the hands of private persons, whose collections I have not been able to examine.

Considering a strictly scientific arrangement in many respects unsuitable for the objects of these notes, I have classified the species in the following manner :—

Native Metals and Metallic Minerals.
Silicates and precious stones that do not contain Silica.
Carbonates, Sulphates, Phosphates, and Chlorides.
Carbonaceous Minerals.

Adding a short notice of the mineral springs known in Victoria.

A great number of the minerals described, have been found and determined during the progress of the Geological Survey, and will, together with nearly all the others, be represented by specimens in the Victorian collection exhibited at the Intercolonial Exhibition by Mr. R. Brough Smyth, Secretary for Mines, to whom, as well as to Mr. A. R. C. Selwyn, Director of the Geological Survey, and Mr. C. D'Oyly H. Aplin, formerly a member of the Survey, I am indebted for much interesting information regarding many of the minerals.

Formidable as this list of species may look at first glance, the collection is, comparatively speaking, in a strictly mineralogical point of view, only a poor one ; especially on account of the rarity or entire absence of finely-crystallized specimens, of a great number, of the species. This must appear the more remarkable if we consider the immense number of quartz-lodes, and the masses and dykes of various plutonic and volcanic rocks that traverse the country, and have already been extensively explored. Many fine crystals may no doubt be overlooked during the progress of the quick and energetic working of our miners ; still, fine druses of ores or other minerals, such as frequently occur in the lodes of other mining countries, would certainly not have escaped their observation.

As regards the general scarcity of ore-lodes, or of lodes with lode-stones other than quartz—calcspar, spathic iron, fluorspar, &c., the principal bearers of lead, silver, and copper ores—it seems probable that this is in some measure due to, or at least stands in connection with, the absence in our Lower Silurian, and the great scarcity in the Upper Silurian, rocks of those broad bands and masses of limestone which characterise the rock-formations of the principal known mining countries.

NATIVE METALS AND METALLIC MINERALS.

Gold.—Occurs mainly in the quartz reefs of the Upper and Lower Silurian rocks, and in the Upper Tertiary cement and drift deposits, which owe their origin to abrasion and denudation of the former. Gold.

Some instances have also been observed of gold being embedded in sandstone (Prior's Reef, Wattle Flat, Castlemaine); in slate (Capper's Reef, Barker's Creek, Castlemaine); in granite (Nuggetty Reef, Tarrangower); in diorite (several of the reefs of Woodspoint and Raspberry Creek); in limestone (in a calcareous cement at Sandy Creek and Mia Mia, Tarrangower). Very frequently it is found enclosed in iron and arsenical pyrites, and in the common, and manganiferous, brown iron-ore: minerals which are rarely absent in any auriferous quartz reef. With regard to its mode of occurrence in the reefs, it is found by practical experience that the gold, at and near the surface, is coarser and generally more loosely embedded (sometimes in cracks or hollows and in the clayey and ferruginons casings) than in depth, and although exceptions are known, it is by most quartz miners acknowledged, so to speak, as a rule, that the gold becomes finer and finer, and more intimately mixed with the quartz and pyrites, the deeper the reefs are worked, and may, in fact, ultimately be hardly discernible as free gold by the naked eye, but exists, microscopically impregnated, or perhaps mineralized, in the pyrites. Judging from the character of the alluvial gold, the above rule receives apparently strong indirect confirmation in the fact that, whilst pieces of above one ounce in weight are generally of rare occurrence in quartz reefs, they are not so in the drifts (composed of the denuded portions of the reefs), which have, besides, yielded the largest masses ever found throughout the world.* The heaviest nugget—*i.e.*, connected mass of gold—known to have been found in a quartz reef weighed nearly 13 lbs., and came from a depth of 40 feet from the surface (Old Quartz Hill, Castlemaine). With regard to the chemical purity or fineness of the Victorian gold, it may doubtless be taken as nearly, if not the best, of any of the known gold countries, inasmuch as its average fineness ranges between 20–23·5 carats, the Ballarat gold being of the highest standard. Only from one district, Lake Omeo, the standard is reported as below 16 carats, the admixture being copper, with a trace of silver; whilst from the other goldfields the reverse is the case, silver being the chief admixture. It may also be mentioned that alloys of gold with *bismuth* have been reported on good authority from

* See models of nuggets, and statistics of the Victorian gold pyramid.

Kingower and Maldon as a rare occurrence; it being, however, not ascertained at the time, whether this mixture of the two metals was natural, or whether it happened artificially in course of the process of amalgamation, and was due perhaps to native bismuth—a metal occurring in those districts—having been originally impregnated in the quartz. A rather strange peculiarity with regard to the respective standards of fineness of alluvial and reef gold consists in the fact that the former is generally of better quality than the latter, though its derivation can frequently—as for instance, in all "alluvial" gullies, "surface" patches, &c., be distinctly traced from quartz reefs in the immediate neighbourhood.

The forms in which the gold occurs in the drifts are flattened smooth scales, roundish grains, and irregularly-shaped roundish masses—"nuggets"—the latter frequently coated with manganiferous brown iron-ore, which has in many instances caused them to be overlooked when first exhumed. In some leads—for instance, at Guildford, Daisy Hill, &c.—portions of the gold are commonly coated with black manganese, or brown iron-ore ("black gold"), and great care is required on the part of the miner to avoid loss in washing. In the neighbourhood of quartz reefs the grains and scales of gold are more angular and often crystalline, characters forming important guides to the experienced quartz miner in prospecting for the reefs themselves. As regards the quartz, or reef gold, it appears mostly in hackly grains, thin plates with ragged edges, often above one inch square, in filiform shapes and irregularly crystalline masses, but very rarely arborescent and reticulated. Perfect crystals of gold occur on nearly all the goldfields; more abundantly, however, on M'Ivor, Castlemaine, Ballarat, Bendigo, &c. They are generally found near the surface, in the clayey, or ferruginous ochery casings of the reefs, very rarely in hollows of the quartz itself, and they occur also in the top stratum of the ground ("surface"), in close proximity to the reefs. At the old Quartz Hill Reef, Castlemaine, the ferruginous casing proved in some places near the surface so rich in gold crystals that several ounces of them—from a pin's-head to a pea in size—were saved by the proprietors of the claim. The forms of the crystals are principally the cube, modified by small planes of the octahedron and rhombic dodecahedron, and these crystals appear often tabularly compressed; the rhombic dodecahedron, as ground figure with replacements by the cube; and more rarely the plain octahedron, and the octahedron with small faces of the cube. Amongst the crystals from the old Quartz Hill Reef, some were highly modified, exhibiting as ground figure the octahedron with small planes of the cube, rhombic dodecahedron, trapezohedron, tetrahexahedron, and hexoctahedron (See Figs. 1[a], 1[b]).* Similarly modified crystals with the cube as ground figure are reported as having been found at M'Ivor and Maldon. Compound crystals appear to be very rare. From several experiments made by the late Dr. L. Becker, by cutting gold crystals in halves, and also by the established low specific gravity and the loss which crystals suffer by smelting, it appears to be very probable that gold crystals generally have a nucleus of quartz, iron pyrites, or of brown iron-ore (decomposed iron pyrites), or require one for their formation. From the Nuggetty Reef, Castlemaine, several fine specimens are known of pentagonal dodecahedrons of iron pyrites enclosed in a skeleton of gold in

* For Figs. of Mineral Species, *vide* Plate V.

the form of the rhombic dodecahedron. At Ballarat many octahedral crystals have been found with sharp salient edges and a triangular cavity in place of each plane, in the centre of which a grain of ferruginous quartz, or brown iron-ore, was clearly observable. With regard to pseudomorph crystals of gold, or of other minerals after gold, no trustworthy observations have been recorded as yet. The statement, that at the New Bendigo goldfield a gold crystal had been found, exhibiting the prism and double hexagonal pyramid—apparently a pseudomorph of gold after rock crystal—has never been satisfactorily corroborated. It has been generally doubted that gold occurs inside quartz crystals; however, in addition to those recorded years ago from the M'Ivor goldfield—one specimen especially (at that time in the possession of the late Dr. L. Becker), a splinter of gold with octahedral faces on both ends, enclosed in a small rock crystal—several undoubtedly genuine finds have lately been made in the Woods-point district. A very fine specimen has also been obtained at Redbank: This is a fine rock crystal, two inches long and above one inch in diameter, which shows several small particles of gold enclosed, one, the largest, being delicately filiform, the others of a more solid, hackly character.

Besides the gold specks this crystal shows another curious feature—it encloses a second rock crystal, which is of a somewhat yellowish hue, hardly $\frac{1}{8}$ of an inch long, and lies in a slanting position.

Having in the foregoing given a short statement of the modes of occurrence, character, &c., of both reef and alluvial gold, it may, perhaps, not be out of place to add a few remarks bearing upon the origin of those interesting phenomena, the large nuggets. If we consider that these consist of the nearly specifically heaviest known matter concentrated into spaces, offering, comparatively speaking, the smallest surface of attack, it must appear evident that a tremendous, so to speak, cataclysmic force would be required to move such lumps, and yet most have been found far removed from auriferous quartz reefs, which the lay or run of the respective gold leads in which they occur points out as the source of the gold; and some in positions—for instance, in the sand overlying the gravel—which, considering their weight and the otherwise regular arrangement of the drift deposit from the surface downward, viz., clay, sand, and fine and coarse gravel, are quite inexplicable. If we add to this, that nuggets even above one ounce in weight are of rare occurrence in quartz reefs, a doubt must naturally arise, whether such ponderous masses, as we now find, have been actually derived from the reefs; and it becomes of interest to inquire whether, perhaps, other sources do not exist, to which they may owe their origin. Considering the rule of the gradually-decreasing size of the particles of gold in reefs, from the surface downward, it might no doubt with just reason be urged that, as the reefs have been extensively denuded (of which the formation of the drifts furnishes convincing proof), the same rule would inversely hold good for the denuded portions—*i.e.*, the particles of gold were gradually increasing in size towards the original surface of the reefs; and as instances are known of nuggets several pounds in weight having been found in our present reefs, the denuded portions might have contained them both of larger size and more numerously. However, sound as this argument may be in certain respects, the general difference in standard of fineness between alluvial and reef gold bears strongly against it, and certain facts and results of experiments besides, lend aid to an hypothesis, some time ago advanced by Mr. Selwyn—namely, "that nuggets

may have been formed, and generally that particles of alluvial gold may gradually increase in size through the deposition of metallic gold (analogous to the electro-plating process), from the meteoric waters which circulate through the drifts, and which must have been, during the time of our extensive basaltic eruptions, of a thermal, and probably highly saline, character, favourable to their carrying gold in solution."

The collateral questions to answer here are—firstly, is gold contained in the meteoric drift water? and, secondly, do agencies exist by which it can be deposited from that solution in a metallic state—*i.e.*, as a solid coating on nuclei presented to it? Both questions are nearly satisfactorily solved, the first by the auriferous character of iron pyrites, occurring frequently in the leads of Ballarat, Clunes, Daylesford, &c., which shows the shapes of roots and branches of trees, forms part of and occupies cavities in driftwood, &c., and is therefore of very recent origin;* the second, by an accidental discovery made by Mr. Daintree some time ago, and also by some recent interesting experiments by Mr. Charles Wilkinson, of the Geological Survey. Mr. Daintree's discovery consisted in the fact that a speck of gold, lying in a solution of chloride of gold, increased to several times its original size after a small piece of cork had by accident fallen into the solution. This signifies, therefore, that organic matter, which is abundantly contained in the drifts, may be the agent by which gold is deposited from meteoric waters in the manner required for the solution of the problem. Mr. Wilkinson's experiments prove further, that besides gold itself, iron, copper, and arsenical pyrites, galena, zincblende, molybdenite, wolfram, &c., form likewise favourable nuclei, which, if immersed in a weak solution of chloride of gold, receive a solid coating of this metal by agency of organic matter (a small chip of wood or bark, for instance, swimming in the solution). In addition to these data, we have the curious coincidence with Mr. Selwyn's views, touching the character of the meteoric water in earlier times, that on our western goldfields only (Ballarat, Daisy Hill, &c.), where evidence of tremendous basaltic eruptions meets the eye on every side, all the large nuggets have hitherto been found; whilst in the eastern and northern goldfields (Gippsland, Yarra, Ovens, &c.), on which basaltic streams are either absent, or of very limited extent, the gold is generally very fine and nuggets above an ounce in weight are of the greatest rarity.

Far as these data tend towards strengthening Mr. Selwyn's hypothesis, there are, however, many doubtful points yet to be cleared up. It is, for instance, of the greatest interest to confirm by careful quantitative analysis of large quantities of drift water, that gold exists in it; to determine in what amount; and, though scarcely practicable, yet of high importance, to find out in what combination. It is certainly most probable that, as our drift waters generally are saline, gold is in solution as a chloride, but should this not be found to be the case, it is necessary to examine whether the new salt (which might, judging from Professor Bischoff's experiments, perhaps be a silicate of gold) is also decomposable in the required way by organic matter, or other agencies, existing in the drifts. The most conclusive test for the confirmation of the hypothesis would no doubt be to ascertain, by cutting nuggets in halves, and careful appropriate analysis afterwards, that they contain nuclei of lower standard gold—the portions

* See Pyrites, page 64.

derived from the reefs—than the surrounding masses—formed by deposition from meteoric waters.

Gold and Silver Alloy.—Occurs sparingly as small specks in the silver reef, St. Arnaud, associated with native gold and silver and chloroblomide of silver. As its colour varies between yellowish-white and pale yellow, the two metals are no doubt combined in very variable proportions.* Gold and Silver Alloy.

Native Silver.—Occurs, though very rarely, in the silver reef and the Wilson's Reef, St. Arnaud. In the former it appears as small hackly specks, embedded in hard quartz; in the latter it is found in cavities, as hairlike filaments, which are generally encrusted with minute, perfect hexagonal prisms of white transparent *mimetesite.* Native Silver.

Chlorobromide of Silver.—This mineral was discovered by Mr. G. Foord in the silver reef, St. Arnaud, where it occurs above the water-level in cavities, cracks, and joints of the quartz, as small roundish grains and crystals, which are often loosely aggregated or connected together like beads on a string. Their colour varies between bright asparagus green and greyish green when freshly broken from the reef, becoming gradually darker on exposure to the atmosphere. In size the crystals hardly exceed a large pin's head, and they are very seldom perfectly developed, but exhibit the planes of the cube with octahedron, and more rarely the rhombic dodecahedron. Their chemical composition is, according to analysis by the late Mr. Charles Wood, analyst of the Geological Survey, the following:— Chlorobromide of Silver.

Silver	65·14	Chemical formula: Ag. Cl. + Ag. Br.
Bromine	24·16	
Chlorine	10·73	
	100·03	

On account of the occurrence of this ore in some quantity in the silver reef, its extraction, or rather that of the silver, has become of practical importance. The methods introduced for this purpose are the Freiberg amalgamation, in connection with Foord's improved modification of Percy's hyposulphite of soda process. The results hitherto obtained have ranged from 20 to above 100 ounces of silver per ton of lodestone. From the disappearance of the mineral beneath the level, where a strongly saline water circulates through the reef, and where veins and strong impregnations of a highly argentiferous galena make their first appearance (in a hard solid quartz which contrasts strongly with the friable cavernous one above), there can hardly be a doubt that it, as well as "arseniate" and "carbonate of lead," with which it is often found associated, have arisen from the decomposition of galena; probably in connection or impregnated with sulphide or sulpho-arsenide of silver, formerly existing above the water level.

Silver-Glance (Sulphide of Silver).—Has been reported from the Ebenezer Reef, at Morse's Creek, Ovens district, as occurring finely impregnated in the quartz, associated with "galena," "blende," "iron and arsenical pyrites," and "gold." It occurs also probably in a similar manner in the silver reef, St. Arnaud. Silver Glance: Sulphide of Silver.

Iridosmine.—Was reported as having been discovered several years ago by Iridosmine.

* See remarks on artificial gold-amalgam crystals. Appended page 82.

the late Count Dembinski as very fine steel-gray particles in "heavy sand"* brought from the Yarra goldfields.

Zinc.

Zinc.—This metal has been found in a basalt quarry at Collingwood, and in the upper pliocene golddrift of Creswick Creek and Daylesford. The specimen from the first locality came from a cavity in the basalt (coated with "arragonite") nearly 20 feet beneath the surface, was of flattish, irregular shape, about 19 ounces in weight, and showed in places a whitish coating of "carbonate of zinc," intermixed with "carbonate of lime" and rose-coloured dots of "cobaltbloom."† The specimens from the other localities were small nodules, coated also with "carbonate of zinc and lime." All the samples contained only small traces of "cadmium," those from Creswick about 1 per cent., according to an analysis by the late Dr. Macadam.

It may also be mentioned here that several years ago a roundish washed piece of "zinc," above one pound in weight, was shown in Melbourne as found by miners in the golddrift of the Mitta Mitta River, New South Wales.

Zinc Blende: Sulphide of Zinc.

Zincblende (Sulphide of Zinc).—This mineral—the "Black Jack" of the Cornish miner—occurs sparingly distributed in the auriferous reefs of perhaps all our goldfields, but more frequently in Russell's Reef, near Malmsbury; Nuggetty Reef, Tarrangower; Wilson's Reef, St. Arnaud; in the reefs of Morse's Creek, Ovens district, &c., forming solid, irregular patches, and small veins of a pitch-black colour, which occasionally show specks of gold embedded. It has not yet been observed in a crystallised state

Native Copper.

Native Copper.—It has been found in roundish washed pieces, several ounces in weight, in the Thomson River, Gippsland, and occurs also often impregnated in the Thomson River copper mine; the Wilson's Reef, St. Arnaud, and very sparingly, as small thin scales occasionally associated with gold, in the Specimen Gully Reef, Castlemaine; the Mariner's Reef, Steiglitz; and the Golden Promise Company's reef, Louisa Ranges, Crooked River. At the Wilson's Reef it is met with very frequently in a black carbonaceous shale, which forms the western wall of the reef, presenting thin crystalline laminæ and often finely-crystallised arborescent and reticulated shapes.

Red Copper Ore: Red Oxide of Copper.

Red Copper-ore (Red Oxide of Copper).—Is found in tolerable abundance in the surface portion of the Thomson River copper lode, distributed in irregular patches and veins, which occasionally show cavities with small cube-octahedral crystals.

Melaconite: Black Oxide of Copper.

Melaconite (Black Oxide of Copper).—Occurs in an earthy or pulverulent state in cavities and joints of the copper lode just mentioned. It is

* "Heavy sand," or "black sand," is a practical miner's term applied to the mixture of fine sand and grains of various specifically heavy minerals (titaniferous and magnetic iron-ore, tin-ore, corundum, zircon, &c.), which are associated with the gold in the washing stuff, and remain during the process of gold-washing up to the last operation—the "tin-dish washing"—in connection with the gold; the perfect cleaning of the latter having to be effected, partly by blowing the sand off, partly by the magnet, and careful picking out by hand.

† See *Transactions of the Philosophical Institute of Victoria*, 1856.

a rather impure oxide of copper, being mixed in variable proportions with sulphide of copper and oxides of manganese and iron.

Malachite (Green Carbonate of Copper).—Is met with in patches and narrow veins in the Thomson River copper lode; also, though sparingly, as coatings and bunches of delicately fibrous crystals in small cavities of the quartz and ferruginous casings of the reefs at Steiglitz and Pyreeth Creek; in the silver reef and Wilson's Reef, St. Arnaud; the Glen Dhu Reef, Landsborough; the Nicholson's Reef, Castlemaine, &c. Malachite Green Carbonate of Copper.

Azurite (Blue Carbonate of Copper).—Occurs, though more rarely, in the same localities as the former mineral, in small, dull, earthy-looking patches, narrow crystalline seams, and occasionally minutely crystallised coatings of cavities. Azurite: Blue Carbonate of Copper.

Olivenite (Arseniate of Copper).—Is found very sparingly as thin reniform coatings in hollows of the Wilson's Reef, St. Arnaud. Olivenite: Arseniate of Copper.

Blue Vitriol (Sulphate of Copper).—Occurs rarely in thin seams and implanted crystalline grains in black earthy oxide of copper at the Thomson River copper mine. Blue Vitriol: Sulphate of Copper.

Copper-Glance (Sulphide of Copper).—Forms small veins and patches, scales, and grains, in copper pyrites at the Thomson River copper mine. It occurs also sometimes finely impregnated in the reefs at Steiglitz. Crystals of this mineral have not yet been observed. Copper Glance: Sulphide of Copper.

Covelline (Indigo Copper).—Is occasionally met with in the reefs at Steiglitz and Dunolly; the Specimen Gully Reef, Castlemaine; the Glen Dhu Reef, Landsborough; the Golden Promise Company's Reef, Crooked River, &c., forming thin, scaly coatings with pearly lustre; sometimes also powdery, glistening incrustations on iron and copper pyrites, quartz, &c. The Steiglitz specimens show this mineral generally mixed with crystalline grains of copper-glance, and, though very rarely, specks of gold. Covelline: Indigo Copper.

Erubescite (Variegated Copper-ore).—Has hitherto only been found at the Thomson River copper mine, in small patches and seams, distributed through copper pyrites. Erubescite: Variegated Copper Ore.

Copper Pyrites.—Occurs massive in veins and large patches at the mine just mentioned, also frequently in narrow seams, implanted grains and finely impregnated, in most of the auriferous reefs of Castlemaine, Maldon, Steiglitz, Bendigo, Ballarat, St. Arnaud, &c. In Joss and Co.'s claim, on the Eaglehawk Reef, Maldon, a vein occurs several inches in thickness (forming, so to speak, the "casing"), chiefly composed of copper pyrites and spathic iron-ore, in which are impregnated iron and arsenical pyrites, galena, and more rarely sulphide of antimony. An assay of this ore by Mr. C. Newbery, analyst of the Geological Survey, gave— Copper Pyrites.

Copper	17 per cent.
Gold	45 ozs. 17 dwts. 16 grs. per ton.

Crystals of copper pyrites have not yet been observed.

Wolfsbergite: Antimonial Copper.

Wolfsbergite (Antimonial Copper).—Occurs very rarely in plate or scale-like crystallisations, associated with gold and various antimony-ores, at the antimony reef, Costerfield, M'Ivor.

Cuproplumbite.

Cuproplumbite.—Has been found impregnated in crystalline grains and in thin seams in the antimony reef at Costerfield, M'Ivor. It appears to be very rare.

Lead.

Lead.—The occurrence of this metal has lately been made known by Mr. R. Brough Smyth in the older pliocene drift lead of Mount Greenock and the Avoca main or deep lead. Several ounces have already been saved in the shape of roundish and flat grains, of all sizes, with a few small, irregular, nuggetty pieces, weighing several pennyweights. Many of the particles contain gold specks embedded.

Cerusite: Carbonate of Lead.

Cerusite (Carbonate of Lead).—Occurs tolerably abundantly in small crystals in cavities of the Wilson's Reef, and the silver reef, St. Arnaud; also in the outcrop of the Nicholson's Reef, Castlemaine, associated with fibrous malachite; in the Glen Dhu Reef, Landsborough, &c. It has, no doubt, arisen from the decomposition of galena. In the Wilson's Reef, for instance, the cavities in which it is found are mostly in galena, and are generally filled with a blueish-black powder, consisting principally of this ore. The crystals from these cavities are often well modified and colourless, transparent, with strong adamantine lustre. Twin-crystals of the usual cross form are also not rare. (See Figures 2, 3.)

Pyromorphite: Phosphate of Lead.

Pyromorphite (Phosphate of Lead).—Has occasionally been observed in the surface portions of the Nicholson's Reef, Castlemaine, the Chrysolite Reef, St. Arnaud, and in some of the reefs of Avoca, Maryborough, and Bendigo, forming small, light green, hexagonal prisms, sometimes modified by narrow planes of the hexagonal pyramid. The faces of the prism are generally curved, imparting to the crystals the peculiar barrel-shape, a characteristic of this mineral.

Mimetesite, Mimetine: Arseniate of Lead.

Mimetesite, Mimetene (Arseniate of Lead).—Occurs in tolerable abundance in drusy coatings and aggregations of white, yellow, and brown crystals in the Wilson's Reef, the Chrysolite Reef, and the silver reef, St. Arnaud. In the first-mentioned reef, fine druses of this mineral have been found, presenting perfectly-transparent, thin, needle-shaped, hexagonal prisms, with adamantine lustre, and modified by planes of the hexagonal pyramid (see Fig. 4), also specimens with specks of gold enclosed between the crystals. The crystals from the Chrysolite Reef are generally colourless and transparent, short, often tabular hexagonal prisms (see Fig. 5); occasionally some are found of a dark brown colour, with resinous lustre, and exhibiting the peculiar barrel-shape. It would, indeed, appear as if this shape were only a characteristic of the coloured, non-transparent variety; for at the silver reef, where the crystals are generally opaque and of light brown or yellow colour, with resinous lustre, they all exhibit this peculiarity. Sometimes cavities are found in the latter reef coated with fine, transparent, acicular crystals; also specimens showing the mineral closely associated with chlorobromide of silver and gold. According to a quanti-

tative analysis by Mr. C. Newbery, the composition of transparent mimetene from the Chrysolite Reef is—

Chlorine	2·00
Phosphoric Acid	0·55
Arsenic Acid	22·31
Oxide of lead	73·43
	98·29
Chloride of lead	7·87
Phosphate of lead	3·19
Arseniate of lead	87·23
	98·29

The barrel-shaped, yellowish-coloured variety contains considerably more phosphate of lead, some lime, iron, and clay, as impurities.

Anglesite (Sulphate of Lead).—Occurs sparingly in small, rather imperfect, colourless and transparent crystals, with adamantine lustre, in cavities of the Wilson's Reef, St. Arnaud, generally associated with cerusite; also in a similar manner in the Glen Dhu Reef, Landsborough. Anglesite: Sulphate of Lead.

Galena (Sulphide of Lead).—Is generally met with finely impregnated in most, perhaps all, auriferous quartz reefs—a circumstance which leads the experienced quartz miner to regard its appearance in the quartz as a favourable sign for the presence of gold in the neighbourhood. Specimens of a rather coarse granular character, with "cerusite" in small cavities, have lately been brought from Gippsland, said to be taken from the outcrop of a well-defined lode of this ore. In the western face of the Wilson's Reef, St. Arnaud (300 feet level south of the shaft), it occurs in solid patches, strings, and irregular veins near two inches thick, also pulverulent, forming in all, perhaps, three to four per cent. of the "payably" auriferous portion of the lode, at this point near 14 feet wide, the whole reef presenting a width of above 40 feet.* Strong veins of this ore have also recently been discovered beneath the water level in the silver reef, St. Arnaud. In accordance with the characteristics of this mineral in all parts of the world, it contains here also variable amounts of silver, ranging according to numerous assays from 20 to above 100 ounces per ton of ore. This latter high yield for galena is reported from the silver reef, St. Arnaud, and is most likely due to some richer silver-ore (perhaps "proustite," or "silver-glance") being minutely disseminated through the mass.† It is a singular fact, that although galena is frequently found associated, and, as for instance at the Pyrenees Reef, densely impregnated with fine gold, the latter metal, according to the assays, never assumes the place of the silver, or even conjointly occupies it in the composition of the ore. Crystals of galena are extremely rare, and those which have been as yet observed are small and very imperfect cubes, with planes of the octahedron. Galena: Sulphide of Lead.

Boulangerite (?).—A combination of sulphur, lead, and antimony, closely resembling this mineral in outward character and behaviour before the Boulangerite (?).

* The Wilson's Reef is, as regards width and compactness, one of the, if not the largest known reef in the colony, exhibiting at the outcrop a thickness of nearly 100 feet, which gradually decreases in depth (300 feet) to the figure above given.

† See chlorobromide of silver.

blowpipe, has been found scantily distributed in a quartz reef at Ballarat, being associated with copper pyrites, and containing specks of gold embedded.

Bournonite.

Bournonite.—Occurs finely impregnated in some of the quartz reefs of Ballarat, St. Arnaud, Steiglitz, &c.; also, in implanted crystalline grains in the antimony reef at Costerfield, M'Ivor. It is apparently very rare.

Native Bismuth.

Native Bismuth.—Has been found in irregularly-shaped roundish pieces, from a few pennyweights to above 1 lb. in weight, in the Wombat Creek, Omeo, and the Upper Yarra. It also occurs at Kingower, and in small crystalline grains, associated with "wolfram," "iron-glance," and "schorl," in a quartz reef at Sandy Creek, Tarrangower. The metal from Wombat Creek is, according to analysis, nearly chemically pure.

Bismuthite: Carbonate of Bismuth.

Bismuthite (Carbonate of Bismuth).—Occurs in tolerable abundance in the washing stuff of the Tin-kettle lead, and of Ramshorn Gully, Sandy Creek, Tarrangower; and is also reported from Kingower. At the two first-named localities it forms greyish or yellowish-white roundish and nodular pieces, from a few grains to several pennyweights, the larger of which show usually, on being broken, a dark colour, tending towards grey metallic in the centre. The chemical composition of this *bismuthite* is, according to quantative analysis of three samples, by Mr. C. Newbery, the following:—

	I.		II.	III.
Oxide of Bismuth	87·22	... ...	85·13	76·22
Protoxide of Iron	0·34	Sesquioxide of Iron.	1·28	4·31
Carbonic Acid	5·55	... ...	5·10	3·28
Insoluble matter, clay, &c. ...	3·46	... ...	6·71	8·35
Water	3·43	... ...	2·13	6·83
	100·00		100·35	98·99

I. Small grains of uniform colour thoughout.
II. Larger grains with discoloured centre.
III. Piece ½-inch in diameter with dark centre.

As shown by these results, the mineral can hardly be considered as a well-defined species, and there is every reason to suppose that it has actually been formed, or at least grown in the drift, small particles derived from quartz reefs in the neighbourhood having perhaps served as nuclei*, as several specimens have been discovered, enclosing small specks of alluvial (waterworn) gold.

Cassiterite, Tin Ore: Stream Tin.

Cassiterite, Tin-ore (Stream Tin).—Stream tin occurs in workable quantity in several creeks of the Ovens district, the tributaries of the Yarra, Thomson, and Latrobe rivers, and in some of the gullies of the Strathbogie ranges. It is also met with in small quantities in the Belltopper lead, Taradale, and at many places in Gippsland. Its colour ranges from light-yellow to brown and jet-black, and there are sometimes sub-transparent grains of a hyacinth to dark-red intermixed, which may easily be mistaken for zircons, garnets, or rubies, more especially as the former occur generally associated with the tin-ore. Small, well-developed single and twin crystals—the former usually square prism, surmounted by

* A reef containing "native bismuth" lies at the head of Ramshorn Gully.

the pyramid, with replacements by another prism and pyramid—are not rare at the Ovens. As regards size, the stream tin from all districts varies generally between fine and coarse sand, pieces as large as a pea or bean being comparatively rare. Several specimens of above an ounce in weight, with, in one or two instances, portions of granitic rock attached, have been found at the Ovens and Strathbogie, yet no veins of the ore, or rock masses impregnated with it, have hitherto been discovered, though there can hardly be a doubt that both exist, and that granite is the respective matrix. At the Ovens the *locale* of such veins, or rock masses, will most likely be within a narrow zone along the granite and silurian boundary, as most of the creeks rising in silurian rocks are reported to be tin-bearing only after they pass that geological line, and the tin-ore is far coarser near it, than further down the creeks. The "washing-stuff" of some of the Ovens creeks affords fine specimens of the so-called "regenerated granite," often richly impregnated with gold and tin-ore, it being granitic detritus, firmly cemented together by hydrous oxide of iron. The following are results of assays of "tin,"—or "black sand,"—by Mr. C. Newbery :—

A sample from the Beechworth district gave as a mean of four assays 53·5 per cent of tin, which was not, however, quite pure, but contained some iron, as seen by the crystallised surface of the buttons.

A sample from the Upper Yarra Tin Company's claim, consisting of cassiterite, titaniferous iron, schorl, sapphires, and gold, gave about 30 per cent. of pure tin-ore, which yielded 67·5 per cent. of tin.

Meteo Iron.

Meteoric Iron.—Two large masses, one of half a ton, the other of about four tons in weight, as also several smaller pieces, have been found in the neighbourhood of Cranbourne. The smaller mass is exhibited at the Public Museum in Melbourne, the larger one at the British Museum.

Iron G Specul Iron.

Iron-glance (Specular Iron).—Occurs very sparingly in small tabular crystals in several reefs at Sandy Creek, Tarrangower; also in a similar manner in dolerite and dolerite-porphyry, near Malmsbury.

Micac Iron O

Micaceous Iron-ore.—Is met with in veins in the metamorphic rocks of the Grampians, also near Lake Tyers, and at several other places in Gippsland.

Red O

Red Ochre.—Is frequent in patch-like accumulations in the tertiary rocks around the coast.

Magne Magne Iron O

Magnetite (Magnetic Iron-ore).—Is abundant in small roundish grains and cube-octahedral crystals in the washing stuff of the gold drifts.

Limon Brown Ore.

Limonite (Brown Iron-ore).—Under this head are included the common *brown hematite*, the *bog iron-ore*, *clay* and *arenaceous iron-ore*, and *brown ochre.* The first of these species occurs frequently in narrow veins and nodular concretions in the silurian rocks at Fryerstown, Maldon, Castlemaine, and generally all the goldfields; it also forms layers and concretions in the tertiary rocks around the sea coast, at Bacchus Marsh, &c. Both in the quartz reefs and auriferous conglomerates it is very common, occurring in the former as small veins, filling crevices and cracks, and often wholly composing the casings; in the latter, it forms the cementing medium for

the boulders and pebbles, and is occasionally found as solid layers or crusts of an inch or more in thickness, with frequently specks of gold embedded—an occurrence which is also more often observed in the ore of the quartz reefs.

Brown Ochre. *Brown Ochre.*—Is known from the tertiary rocks around the coast, and occurs also occasionally in hollows of quartz reefs.

Bog Iron Ore. *Bog Iron-ore.*—Occurs in the neighbourhood of Lake Connewarre, in Batman's Swamp, and will most likely be found around the margins of all our lakes and swamps, more especially those which receive the drainage from country covered by basalt, or where this rock has been denuded.

Clayey and Arenaceous Iron Stones. *Clayey and Arenaceous Iron Stones.*—Are the most abundant, both in the silurian and tertiary rocks, forming beds, impregnated concretionary patches, &c. These latter appear in the silurian as indurated, lenticular zones across the strike of the rocks (St. Arnaud), or more frequently are confined to irregular patches, extending only a few feet beneath the surface (Guildford, Malmsbury, &c.). Their origin appears to be principally due to percolation of ferruginous water from a former denuded covering of basalt.

A peculiar variety of brown iron-ore, shot-like, or often pea or bean shaped concretions, is abundantly distributed over the surface of the basaltic plain of the Loddon valley and the slopes of the neighbouring silurian ranges; it occurs also in great quantities throughout the extensive post-basaltic brown loam deposit which appears around the margin of the Murray River basin, and in the river-valleys of the Werribee, Loddon, Campaspe, Little River, &c. The following are results of assays and an analysis, by Mr. C. Newbery, of samples of brown iron-ore from different parts of the colony :—

	Per cent. Iron.
Brown hematite from Moonee Ponds contains	50·68
Bean-ore from Eddington, Loddon valley	44·34
Arenaceous iron-ore, from Mordialloc	24·26
Brown iron-ore, round west bank of Saltwater river, contains	46
Brown iron-ore from Greenstone range, east of Lancefield	52
Brown iron-ore from Opossum Gully, South Muckleford	47·7

Argillaceous iron-ore from Western Port gave by analysis :—

Peroxide of Iron	55·14	= 38·598 per cent. of iron
Alumina and lime	10·62	
Silica	24·17	
Water	10·07	
	100·00	

Attention has frequently been drawn in the newspapers to our various deposits of iron-ore, and regret expressed at the want of public energy in their not being made commercially available; it is, however, to be feared that this will remain a standing complaint until we can successfully compete, as regards cheapness of production of the metal, with the principal iron-producing country—Great Britain—a time which can only arrive on the discovery of good coal seams, easily accessible from the iron-ore deposits, combined with a fall in the price of labour.

Titaniferous Iron Sand. Menaccanite. Iserine. *Titaniferous Iron Sand, Menaccanite, Iserine.*—Titaniferous iron sand occurs abundantly in the gold drifts of perhaps all our goldfields; in the drainage channels from and in the detritus of basalt escarpments, of

which rock it forms no doubt an important component. As far as can be made out, it consists of the two species, *menaccanite* and *iserine*.

Menaccanite.—Appears mostly as very fine black sand, but is occasionally also met with in small tabular crystals, with edges replaced (rhombohedral), more frequently in flattish pieces up to the size of a small bean, showing metallic adamantine cleavage planes, which can also be produced easily by breaking rounded particles of the ore. *Iserine* does not occur so frequently as the former, but generally also as fine sand; sometimes, however, as rounded grains of pea-size, and more rarely as small cube-octahedral crystals. Larger grains on being broken show only imperfect cleavage planes. It is strongly magnetic, and this property, in addition to the indistinctness of the cleavage, appears to distinguish the uncrystallised mineral (sand or roundish grains), from menaccanite, which, though closely resembling it in outward appearance and behaviour before the blowpipe, is not, or only very slightly, magnetic. Menaccanite. Iserine.

Chromic Iron.—Is found abundantly in the Heathcote Creek and Argyle Gully, near M'Ivor, and reported from Riddell's Creek, near Mount Macedon, forming a fine black sand, wholly composed of minute, exceedingly sharp octahedrons. It also occurs, finely impregnated in quartz reefs and quartzose rocks, near Heathcote, Strathloddon, &c. Chromic Iron.

Wolfram.—Occurs in a quartz reef in the neighbourhood of the Big Hill railway tunnel, near Sandhurst, also in a quartz reef at Sandy Creek, Tarrangower, associated with native bismuth, iron-glance, schorl, &c. Crystals are extremely rare. The gold drifts of the Dandenong and Upper Yarra goldfields, and more especially the drift of Ramshorn Gully, Sandy Creek (a gully which heads at the quartz reef just mentioned), contain it abundantly in small angular and rounded particles. Wolfram.

Chalybite, Spathic Iron (Carbonate of Iron).—Forms the lodestone of the copper pyrites vein in Joss and Co.'s claim, Eagle-hawk Reef, Maldon, and occurs also sparingly in small rhombohedrons with curved faces in crevices and joints of Lisle's Reef, near Mount Tarrangower. Massive patches of this mineral have also been reported from some of the reefs of St. Arnaud. The variety "*sphærosiderite*" is tolerably abundant in the basalts of many localities (Loddon outliers, Sunbury, Campaspe Falls, Ballan, &c.), generally those basalts affected by decomposition, forming globular nobs and botryoidal coatings of a yellow, or yellowish-brown colour in the cavities. Nodular masses of this mineral occur also in the mesozoic coal measures near Geelong. Chalybite, Spathic iron Carbonate of Iron. Sphærosiderites.

Pharmacosiderite, Cube-ore (Arseniate of Iron).—Has lately been found as drusy coatings of brownish-red sub-transparent crystals (cubes), up to one-eighth of an inch in size, in the Port Phillip Company's mine, Clunes, covering quartz and "black manganese ore." The larger crystals show like rhombohedrons of "brownspar," a peculiar curvature of the faces, as recorded of the sub-species of cube-ore "*Beudantite*." On the smaller crystals, however, this feature is absent, and it would therefore appear to be a character incident on the growth of the crystals beyond a certain size. Some of the smaller crystals show also hemihedral planes of Pharmacosiderite. Cube Ore: Arseniate o Iron. Beudantite.

the octahedron. Before the blowpipe this cube-ore shows a small trace of manganese.

Perfect cubes of "*pharmacosiderite*" of various shades of green, very rarely reddish-brown colour, occur associated with arsenical pyrites in cavities of the Beehive and German Reefs, Maldon, the Armenian Reef, St. Arnaud, and several of the reefs of Maryborough, Sandhurst, and Crooked River.

This mineral has, perhaps, in all instances resulted from the decomposition of arsenical pyrites (an ore which is always found more or less decomposed in its neighbourhood), and occurs in the Beehive Reef, Maldon, occasionally associated with, or enclosing, minute specks of gold, which were no doubt once contained in the pyrites.

Scorodite: Arseniate of Iron.

Scorodite (Arseniate of Iron).—Forms drusy coatings of small, well-developed leek-green and liver-brown crystals, in cavities of the Abe Lincoln Reef, Crooked River, always associated with arsenical pyrites. It also occurs, though rarely, in Blucher's Reef, Maryborough, and in the Beehive Reef, Maldon; in the latter not unfrequently associated with "pharmacosiderite," the crystals of both minerals being in close contact, as if simultaneously formed.

The form of the crystals of *scorodite*, both from the Abe Lincoln Reef and Beehive Reef, accords exactly with that of specimens from Saxony (Fig 6). In some of the claims on the Beehive Reef a pale-greenish earthy mineral is met with, forming ochreous crusts in cavities of the quartz, and on arsenical pyrites. As this substance exhibits before the blowpipe, and also tested in the moist way, all the chemical characters of *scorodite*, it might perhaps justly be classed as "*earthy*, or *ochreous scorodite.*"

Vivianite, Blue Iron Earth: Phosphate of Iron.

Vivianite, Blue Iron Earth (Phosphate of Iron).—Occurs in nodular earthy masses of a pale smalt-blue colour in the older decomposed basalt of Phillip Island, especially in places where recent guano deposits exist on the surface, its origin in this instance being most probably due to the water percolating through the guano becoming charged with phosphate of ammonia, which acted on the iron of the decomposed basalt. *Blue Iron Earth* has also been reported from the basalt of Ballarat.

Nontronite, Chloropal: Silicate of Iron.

Nontronite, Chloropal (Silicate of Iron).—Is found in Brewer's Reef, Maldon, in irregular small seams and patches of light pistachio to bottle-green colour, mostly soft and earthy. It also occurs in a similar manner at several places in the first few feet of the silurian rock bottom of the "Pretty Sally's Lead," Maldon.

Copperas, Green Vitriol: Sulphate of Iron.

Copperas, Green Vitriol (Sulphate of Iron).—Occurs in groups of light blueish-green, very irregular crystals, in crevices of the Beehive Reef, Maldon, where it evidently has proceeded from the decomposition of iron pyrites, which at that particular spot is very abundant. Tested before the blowpipe, it affords small traces of copper.

Copiapite(?): Basic Sulphate of Iron.

Copiapite (?) (Basic Sulphate of Iron).—This mineral, which is, no doubt also a product of the decomposition of iron pyrites, impregnates, or rather is disseminated, through certain beds of the upper miocene formation near

Point Addis, Geelong, to such an extent (above 50 per cent.) as to render it probably of commercial importance. The beds have the appearance of yellow sandstone, and an analysis of a sample by Mr. R. Daintree, the discoverer of the deposit, gave the following results :—

Sulphuric acid	16·278
Peroxide of Iron	28·495
Potassa	4·092
Water of constitution	6·935
Water of combination	0·850
Insoluble residue	43·350
	100·000

Rejecting moisture and insoluble matter, the contained mineral will give:—

Sulphuric acid	32·758
Peroxide of iron	47·482
Potassa	7·332
Water	12·428
	100·000

According to this latter result the mineral does not (except as regards sulphuric acid) correspond in chemical composition with any of the species generally classed under "*Copiapite*" (*Fibroferrite, Stypticite, &c.*); however, as these latter are not considered well-defined chemical compounds, and as from its mode of occurrence the mineral under notice could not be analysed *per se*, and some of the iron and potassa may therefore have come from the rock material through which the mineral is disseminated, we should hardly be justified in naming it as a new species.

Iron Pyrites (Cubic Pyrites).—This mineral—the "mundic" of the quartz miner—is the most common ore in auriferous quartz reefs, occurring in narrow veins, or finely impregnated in many cases to the extent of 6 to 8 per cent. per ton of lodestone. It is always more or less auriferous ; the results of assays ranging from $1\frac{1}{2}$ to 200 ozs. of gold per ton. Localities where auriferous pyrites especially rich occur are Morse's Creek, Ovens district, Mount Blackwood, Crooked River, Tarrangower, St. Arnaud, &c. It is sometimes also argentiferous, as, for instance, at the Glen Dhu Reef, Landsborough, from whence a sample, assayed by Mr. C. Newbery, yielded :— **Iron Pyrites Cubic Pyrites.**

	ozs.	dwts.	grs.	
Silver	42	[illegible]	4	per ton of 2240 lbs.
Gold	1	4	1	

Crystals and druses of pyrites are very frequent, presenting mostly cubes with the planes of the pentagonal dodecahedron. In Bell's Reef, Tarrangower, cubes have been found of half an inch and more in size. The slates, generally those of a blueish-black colour, and also though more rarely the sandstones, which form the walls of reefs, contain abundance of small, perfect, cubical crystals (Wattle Gully Reefs, Castlemaine ; Kangaroo Reef, Malmsbury ; Mariner's Reef, Maryborough; Liverpool Reef, Tarilta, &c.); and more rarely pentagonal dodecahedrons, sometimes flattened (Nuggetty Reef, South Muckleford), and cubes modified by the latter, and the octahedron (Raspberry Creek Reefs, Garibaldi and Shamrock Reefs, Woodspoint district, &c.). This kind of pyrites has also been proved to be auriferous to the extent of from a quarter to two ounces of gold per ton. It is more easily decomposed by the action of the atmosphere than the pyrites

of the reefs, and there is this peculiar difference to be observed, that the pyrites embedded in the slates is generally converted into "basic-sulphate of iron," imparting to the rock in places quite a mottled-yellowish colour and an alum taste, whilst that of the sandstone seems mostly to change into "brown iron-ore." In the gold drifts (Ballarat, Daylesford, Clunes leads, Loddon River alluvium, near Vaughan, &c.), pyrites is often found encrusting or entirely replacing roots and driftwood; such specimens very quickly decompose on exposure to the atmosphere, and samples have, on assay by Messrs. Daintree, Latta, and Newbery, likewise yielded from a few pennyweights to several ounces of gold per ton. According to Mr. H. A. Thompson,* "a beautiful specimen of crystallised iron pyrites, deposited on a piece of wood, taken from the drift immediately below the basalt at Ballarat, gave by assay 40 ozs. of gold per ton; and in another case, where only the pyrites from the centre of an old tree trunk was examined, the yield was over 30 dwts. of gold per ton. Some of the fine dust obtained in washing out the gold at the Royal Saxon claim, Ballarat, yielded by assay over 15 ozs. of gold per ton. When placed under the microscope, this dust was seen to be composed of minute crystals of pyrites, aggregated into round pellets from 1-300th to 1-100th of an inch in diameter, the surface being roughened by the projecting angles of the crystals and un-waterworn."

The auriferous character of the pyrites contained in our quartz reefs (including under this general term the two species next to be noticed, viz., arsenical and magnetic pyrites, which also contain gold), has long been known, and many persons have drawn attention to the great loss (computed at from 50·75 per cent. of the total loss) which the quartz miner suffers through the escape of these ores during the process of crushing; still the experiments made hitherto, to effect their saving, have only been very limited, and but partially successful, and therefore no comprehensive system, both for saving and treating them, for the extraction of the gold, has as yet been generally introduced. The extraction of the gold from the pyrites is comparatively speaking a simple process, consisting in roasting the ore sweet and amalgamating the residue; but there are several circumstances combining to make the profitable concentration of the pyrites a most difficult problem to solve. On account of the high price of labour, it would, for instance, in most cases not pay to allow the crushed material to settle, and to conduct the extraction of the pyrites as a separate operation. The machinery for this purpose must commence its action directly the waste leaves the last gold-saving apparatus, and its working effect must besides be commensurate with the supply of material from the stamps. In addition to this there is, however, another the chief problem to solve—namely, that of acting up to the principle upon which all known systems of wet ore-dressing are based—*i.e.*, the making use of the, in this instance very small, difference in the respective specific gravities of quartz and pyrites. To effect this, even when the two minerals are in grains of equal size, is extremely difficult, and the difficulty is here considerably increased owing to the finer state of subdivision as compared with that of quartz, to which the pyrites is reduced on account of its greater brittleness, and to obviate the ill effects of which would

* See paper read by Mr. Thompson, September 10th, before the Royal Society, published in supplement to *Argus*, September 19, 1866.

require costly classifying apparatus and great care and supervision. On reviewing all these points in their various bearings, it must be considered a matter of congratulation on the part of the mining community that recently a machine has been invented, or rather an old well-known machine —the percussion table—rendered capable, by a few simple additions and by being worked in a certain manner, of easily and satisfactorily saving the pyrites, as proved by a number of successful experiments on a large scale. A description of the new method and machine are given by Mr. H. A. Thompson, the inventor, in the paper cited above, as also a succinct account of a number of experiments, and of all points connected with the saving of pyrites and of gold generally.

Arsenical Pyrites (Mispickel).—Is, next the former, the most frequent ore in auriferous reefs, occurring in solid veins often several inches thick (Whip Reef, Sandhurst; Lisle's and Manton's Reefs, Tarrangower, &c.), irregular patches, and finely impregnated. According to numerous assays it is generally highly auriferous, containing from 2 up to 40 ozs. of gold per ton. Crystals are not very frequent in the reefs, but occur often, though of the simplest form, in great abundance in the slate and sandstone walls, cross-shaped twins being very common amongst them (Fig. 7 and 8). It seems to decompose easily (though less so than iron pyrites), imparting a greenish colour to the quartz, casing, and rock walls, and giving rise to the formation of two species of arseniates of iron, "*pharmacosiderite*" and "*scorodite*," which have already been described. Sometimes, especially in sandstone, it is also found converted into brown iron-ore, or wholly removed, whence originate those peculiar oblong slits and cross-shaped cavities observable in the bounding rocks of many reefs (Nimrod Reef and Wattle Gully Reefs, Castlemaine; Wilson's Reef, St. Arnaud, &c.).

Arsenical Pyrites: Mispickel.

Pyrrhotine (Magnetic Pyrites).—Is tolerably abundant in the reefs of the Howqua river district, also in Specimen Gully Reef, Castlemaine; Nuggetty, Brewer's, and Tiverton Reefs, Maldon, &c., occurring generally finely impregnated, more rarely in narrow irregular veins and small solid patches. At the Tiverton Reef it is densely impregnated through the metamorphic sandstone which forms the walls of the reef, and small though imperfect crystals are occasionally met with. It contains according to assays from two to ten ounces of gold per ton. An analysis by Mr. Charles Wood of a specimen of the ore from a reef on Mount Timbertop, Howqua river district, gave—

Pyrrhotine: Magnetic Pyrites.

Iron	60·465
Sulphur	39·165
Residue	0·293
	99·923

Pyrolusite (Grey Manganese Ore).—Fine specimens of this mineral have been found by Mr. B. Smith in the Pleasant Creek and Ararat mining districts.

Pyrolusite: Grey Manganese Ore.

Psilomelane (Black Ferro-Manganese-ore).—This ore occurs very abundantly in mammillary crusts and concretions in the quartz reefs of all the goldfields. It also occupies in the auriferous conglomerates of some localities the place of the common brown iron-ore in cementing the pebbles

Psilomelane: Black Ferro Manganese-Ore.

together—for instance, at the Hard Hills, Strangway's; the Shakspeare Hill, Tarilta, &c.—and then often contains specks of gold embedded. In quartz reefs it appears as one of the most recently-formed minerals: as, wherever in contact, it forms coatings over most of the others (gold, quartz, chlorobromide of silver, iron and arsenical pyrites, &c., "diallogite" and "cube-ore," which have been found at Clunes coating it, being rare exceptions.) From certain appearances in the drift-heaps of recent workings on the Shakspeare Hill and the Hard Hills, its formation seems to be going on rapidly, even at the present day, as the surface of those heaps is dotted over with black patches and small concretions, the latter often connected together in, so to say, solid dendritical shapes. In the sands and clays it occurs in cylindrical pieces, composed of connected nodules, not unlike a series of knots on a string, sometimes flattened, sometimes elongated, the terminal nodules being generally more or less conical or pointed, imparting the idea that they are slowly growing or creeping onward through the matrix in which they occur. Frequently several of these cylindrical pieces are found like dendrites connected together. With regard to the latter in general, they are found abundantly distributed through the silurian slates and sandstones on every goldfield. The following are results of analyses by Mr. C. Newbery, of Psilomelane, from several different localities:—

	I.	II.	III.	IV.
Oxides of Manganese	54·28	49·28	62·63	77·14
Sesquioxide of Iron	20·16	18·73	10·31	6·3
Baryta	2·51	4·21	0·20	11·33
Oxide of Cobalt	2·86	—	5·12	—
Oxide of Copper	0·92	1·21	trace	—
Lime	1·40	1·00	—	—
Alumina	—	5·12	—	1·43
Silica	6·21	8·91	4·60	3·5
Water	12·02	12·25	16·01	0·2
	100·34	100·71	98·87	99·90

I. Specimen from Parkin's Reef, Tarrangower; forms mammillary crusts in crevices and joints of the quartz.

II. Specimen from a quartz reef at Ramshorn Gully, Sandy Creek, occurring in narrow veins and mammillary crusts.

III. Specimen from Strathloddon, forming fine botryoidal crusts in crevices of hard ferruginous silurian sandstone.

IV. Specimens from Gipps Land occurs massive, containing cavities filled and coated with earthy matter.

A comparison of the results of these analyses shows, that the specimens do not only not agree amongst themselves, but differ still more strongly in chemical composition from European specimens—the principal distinguishing points, as regards the latter, being the considerable amount of iron and smaller quantity of manganese they contain (No. IV. makes a slight exception); though in outward appearance and general physical character there is hardly any apparent difference between the respective specimens. "Psilomelane" from its variable chemical composition, is, however, generally not regarded as a well-defined mineral species; and though our colonial ore differs very greatly from the European one, still it would not be advisable to separate it as a new species, though as a variety it would certainly deserve to be called "*Black Ferro-Manganese-ore.*"

Wad, Bog-Manganese.

Wad, Bog-Manganese.—Occurs near Merton, in the valley of the Goulburn.

Diallogite (Carbonate of Manganese).—Occurs in crevices and cavities in the quartz reefs of the Port Phillip Company's mine at Clunes, forming mammillary and botryoidal crusts of rose-red colour over quartz and psilomelane. Diallogite: Carbonate of Manganese.

Rutile (Titanic Acid).—Is occasionally found in the washdirt of the Blue Mountain and Upper Yarra goldfields, in flattish, slender pieces, which are sub-transparent, of a brownish-red colour, and show metallic adamantine cleavage planes. Crystals are very rare; those found are small, longitudinally striated, eight-sided prisms, modified by well-developed planes of two dimetric octahedrons (Fig. 9). Rutile: Titanic Acid.

Brookite (Titanic Acid).—This rare mineral was first identified by Mr. R. Brough Smyth, in quartz brought by Mr. Gladman from the Baw Baw diggings, Gippsland. It forms thin seams of a light chocolate colour. Brookite: Titanic Acid

Chrome Ochre.—Is found in thin irregular seams and patches of dark emerald-green, or sometimes yellowish-green colour, in several quartz reefs near Heathcote, Strathloddon, and other places. It is apparently no fixed chemical compound, but simply a clayey material coloured by an admixture in variable proportions of oxide of chromium, derived from the decomposition of minute octahedral crystals of chromic iron, scattered through the quartz. The greenish-coloured spots frequently observable in the respective reefs have also the same origin. Chrome Ochre.

Molybdenite (Sulphide of Molybdenum).—Fine hexagonal plates of this mineral, with the terminal edges replaced (Fig. 10), and of from $\frac{1}{4}$ inch to $\frac{1}{2}$ inch diameter, occur thickly embedded in a quartz vein traversing granite at Yackandandah; it also occurs in a similar manner at Reedy Creek, and very sparingly dispersed in small scales through the granite at the breweries, near Maldon. The Yackandandah mineral contains, according to assays, a small percentage of silver. Molybdenite: Sulphide of Molybdenum.

Cervantite (Antimonial Ochre).—Is frequently found in the antimony reef, Costerfield, forming light-yellow to cream-coloured crusts on grey antimony ore; its origin, as well as that of the two minerals next to be noticed, being no doubt due to the decomposition of the latter. Cervantite: Antimonial Ochre.

Valentinite (White Antimony).—Occurs very sparingly in small light-yellow and rose-red prismatic crystals, with pearly lustre, in crevices and hollows of grey antimony at the antimony reef, Costerfield, and the Morning Star Reef, Woodspoint (Drysdale's claim). Valentinite: White Antimony.

Kermesite (Red Antimony).—Is very rarely found in powdery coatings and small tufts of cherry-red capillary crystals in crevices and hollows of grey antimony in Drysdale's claim, Morning Star Reef, Woodspoint. Kermesite: Red Antimony.

Antimony-Glance, Grey Antimony-ore (Sulphide of Antimony).—Occurs massive in strong veins at Costerfield; also in strings and patches at Reedy Creek, Whroo; Fentiman's Reef and Eaglehawk Reef, Maldon; Templestowe Reef, near Melbourne; Morning Star Reef, Woodspoint, and in several Antimony Glance, Grey Antimony Ore: Sulphide of Antimony.

reefs of Ballarat, Daylesford, Maryborough, Blackwood, Caledonia, and Anderson's Creek goldfields, &c. At all the places mentioned, this ore is always in connection with auriferous quartz, and is itself frequently visibly impregnated with specks of gold. Assays have shown up to 8 ozs. of gold and 80 ozs. of silver per ton. It is very rarely found crystallised. Some specimens from Drysdale's claim, Morning Star Reef, show slender, generally curved, four-sided prisms, longitudinally deeply striated, with very imperfect terminal planes. Costerfield is at present the only locality where this ore is saved and utilised; partly for the production of antimonium, partly for export to England. The following are results of two analyses by Mr. Charles Wood of different samples of grey antimony from Costerfield:—

	I.	II.
Antimonium	69·82	68·01
Sulphur	25·98	25·30
Silica	3·62	6·95
Moisture	0·34	—
Loss	0·24	—
	100·00	100·26

I. Specimen of fine crystalline ore.

II. Specimen of antimony very dense and of pure steel-grey colour.

Washed pieces of grey antimony have repeatedly been found in the washdirt of some of the deep leads of Ballarat, no doubt derived from quartz reefs in the neighbourhood.

Native Sulphur.

Native Sulphur.—Occurs sparingly in small, shining, imperfectly-developed crystals in crevices and hollows of grey antimony in the antimony reef, Costerfield, and the Fentiman's Reef, Maldon. To judge from their recognisable planes, the crystals from the latter reef would, if perfect, be apparently very highly modified (see Fig. 11). Native sulphur is also met with in clear light-yellow grains, scattered through a bluish-black powdery substance, principally composed of galena, which fills cavities and crevices in the Wilson's Reef, St. Arnaud, and the Specimen Gully Reef, Castlemaine.

SILICATES, AND PRECIOUS STONES THAT DO NOT CONTAIN SILICA.

Analcime.

ZEOLITES.—*Analcime.*—Occurs abundantly in druses of fine, mostly transparent, colourless crystals, in the amygdaloidal basalt of Phillip Island, their form being generally the unmodified trapezohedron; small planes of the octahedron occur very rarely. The size of the crystals varies from a small pin's-head to that of a pea.

Natrolite: Mesotype.

Natrolite, Mesotype.—Is generally associated with analcime in the basalt of Phillip Island, forming divergent, interlacing, or mostly stellate bunches of white or colourless transparent acicular crystals, presenting a combination of the rectangular prism, surmounted by a pyramid over the faces; only occasionally crystals are met with, modified by a second pyramid replacing the terminal edges of the former (Figs. 12 and 13). Nodules of natrolite,

often several inches in diameter, with a fine radiating structure, are also not rare in this locality.

Chabazite.—Occurs abundantly in druses of small, yellow, opaque, sometimes semi-transparent crystals, in hollows of the decomposed older basalt of the Pentland Hills, near Bacchus Marsh; also as small white, subtransparent crystals in the basalt bordering the Tullaroop Creek, near Clunes. Druses of perfectly transparent, colourless, often highly-modified single and compound crystals are found in the basalt obtained from the shaft sunk near De Graves's mill, Malmsbury. (Figs. 14—16.) Chabazite.

Gmelinite.—Is found very sparingly in small nests of yellowish or pale flesh-coloured opaque crystals, in the amygdaloidal basalt of Phillip Island. The form of the crystals is exactly that of European specimens. (Fig. 17.) Gmelinite.

Herschelite.—This rare zeolite was first discovered by Mr. Charles Wilkinson, of the Geological Survey, in the basalt quarry near Richmond, where it occurs in fine druses, and occasionally solitary perfect crystals, white, opaque, or semi-transparent, on a thin deposit of greenish-black soapy clay, which lines the cavities and cracks of the basalt. The form of the crystals is a thin hexagonal table, composed of a double six-sided pyramid, the faces uneven, of fine glassy lustre, truncated by curved, dull, or roughish-looking planes. The hexagonal prism has not been observed as yet, but many crystals show small triangular replacements by a second, more obtuse pyramid, on the terminal corners of the main pyramid; and it must also be mentioned that the planes of the latter are broken—*i.e.*, exhibit indented angles—in the direction of the main axis (see Figs. 18.$^{a\,B}$), a phenomenon which must lead to the conclusion that the crystals are individually compounded of several rhombohedrons, with the basal plane in common. An accurate measurement of angles would be a matter of great difficulty. The crystals are generally aggregated in fan-shape, or by crossing each other at various angles, form rosette-like groups, somewhat resembling double crosses of "Phillipsite." (Fig. 19.) Their size seldom exceeds $\frac{1}{4}$ of an inch. Herschelite.

Heulandite—Occurs sparingly as thin drusy coatings, composed of very small, semi-transparent, yellowish crystals, in the crevices and joints of the metamorphic sandstone which forms the walls of Lisle's Reef and Lennox's Reef, near Mount Tarrangower. The crystals appear in no way to differ in form from those obtained in the silver mines of St. Andreasberg, in the Hartz. (Figs. 20 and 21.) Heulandite.

FELDSPARS.—*Orthoclase.*—Besides forming the principal component of our granitic rocks, this species occurs in veins, either solid or massively associated with quartz, in the neighbourhood of the granite and silurian boundaries (Maldon, Elphinstone, Harcourt, &c.). Crystals are comparatively rare. Very perfect ones, though partly decomposed, are found in the detritus of a feldspar porphyry dyke in Timbillica Valley, East Gippsland, and in that of a similar dyke near Kangaroo Flat, Talbot. About three miles due east of the township of Bradford, near Maldon, a patch of quartz occurs in the granite, interlaced with pink-coloured orthoclase crystals in four-sided prisms, some three-quarters of an inch square and Orthoclase. Adularia: Moonstone.

two to three inches long; they are, however, terminally, seldom well developed. From Reid's Creek, near Beechworth, fine druses have been exhibited, showing well-developed flesh-coloured crystals of two to three inches in size; also small pieces of *Adularia (Moonstone)*, with weak chatoyant reflections.

Albite.

Albite.—Forms narrow veins and druses of fine crystals in the Blacksmith's Gully Reef, Fryerstown. At several places the quartz of this reef assumes quite a porphyritic appearance by embedded crystals of *albite;* at other spots both minerals are mixed in such a manner as to justify the term "binary granite." Groups of *albite* crystals occur at Eaglehawk Reef, Sandhurst, also in several quartz reefs, and in a syenitic rock, in the neighbourhood of Tarilta. A quantitative analysis of albite from the Blacksmth's Gully Reef, by the late Mr. Charles Wood, Geological Survey analyst, gave the following results:—

Silica	68·73
Alumina	20·55
Sesquioxide of iron	0·20
Lime	trace
Potassa	trace
Soda	10·43
	99·91

Oligoclase.

Oligoclase.—This species is found in transparent colourless, occasionally white opaque pieces, with imperfect crystal outline, in the scoriaceous basalts of Mount Franklin and the Anakies. Round the margin of Lake Purrumbete washed pieces of similar character, with occasionally crystal planes, are found in great abundance, no doubt derived from the scoriaceous basaltic lava of the neighbourhood. *Oligoclase* of a pale grey or greenish colour is also, though rarely, met with in the granite of the Black Hill near Kyneton, of Tarrangower, Harcourt, &c. According to a quantitative analysis by the late Mr. Wood, the composition of specimens from the Anakies is the following:—

Silica	64·22
Alumina	23·87
Sesquioxide of iron	1·53
Lime	trace
Magnesia	0·38
Soda, with some potassa	9·87
	99·87

Labradorite.

Labradorite.—Forms a conspicuous component of "porphyritic dolerite" in the neighbourhood of Malmsbury, appearing as slender prismatic, yellowish-white crystals, which densely interlace the rock. Small, imperfect tabular crystals are also met with in cavities of this dolerite, and in the anamesite of Table Hill, near Guildford, and the Loddon basaltic outliers generally.

Kaolin.

Kaolin.—Forms extensive deposits at Bulla Bulla, Dunolly, Govett's home station near Kyneton, and other places. An attempt was made by a company to work the deposit at Bulla Bulla, but, probably on account of the high price of labour, the undertaking has not proved successful.

Fire Clay.

Fire Clay.—A fine white variety of this material covers, as a bed of above three feet in thickness, the lignite deposit at Lal Lal, near Ballarat.

From an analysis of this clay the late Mr. Charles Wood obtained the following results:—

Insoluble silicate of alumina	92·60
Soluble silicate of alumina	1·33
Oxide of iron	trace
Soluble silica	0·53
Water of constitution driven off at red heat	5·80
	100·26

All experiments prove this material to be an excellent fire clay.

Pholerite.—Is found in white, soft, unctuous scales, or velvet-like films and coatings, in the Blacksmith's Gully Reef, Fryerstown; also in a similar manner in several quartz reefs at Bendigo. At the former locality this mineral has evidently arisen from the decomposition of "albite," which is always in close contact with it, and more or less of a soft, crumbling character. According to an analysis by the late Mr. Wood, the composition of this *pholerite* is as follows:— Pholerite.

Silica	44·92
Alumina	42·69
Water	12·79
	100·40

Selwynite.—This mineral is allied to "Pyrosclerite," but differs materially from it by its chemical composition and physical properties, and therefore forms a new mineral species, which is named after Mr. A. R. C. Selwyn, the director of the Geological Survey of Victoria. It occurs massive as a vein in the upper Silurian Rocks, near Heathcote, and is traversed by thin seams of "Talc." The hardness of the mineral is 3·5; specific gravity, 2·53. Its colour is a fine emerald green, which has caused many persons to mistake it for copper ore. It is translucent on the edges; fracture, uneven and splintery; brittle; lustre, earthy; takes a fair polish, and might perhaps be used for ornamental purposes. Before the blowpipe it becomes white, and fuses on the edges to a greyish white blebby glass; gives off water in a mattrass; colours the beads of borax and salt of phosphorus faintly chrome-green; it is only partially soluble in the strong acids. A quantitative analysis by Mr. J. Cosmo Newberry afforded the following results— Selwynite.

Silica	47·15
Sesquioxide of Chromium	7·61
Alumina	33·23
Magnesia	4·56
Water	6·23
	98·78

Which gives as Oxygen ratios of Proto- and Per-Oxide bases, and Silica, 1 : 9 : 12
Corresponding to the Formula

$$Mg\,O\,Si\,O_3 + 3(8/9\,Al_2\,O_3 + 1/9\,Cr_2\,O_3)\,Si\,O_3 + 3HO$$

OR

$$(1/10\,Mg\,O_3 + 9/10\,(8/9\,Al_2\,O_3 + 1/9\,Cr_2\,O_3)\}\,Si\,O_3\,6/5 + 1/3\,HO$$

Agalmatolite—Occurs in nodular masses of white, yellowish, or often reddish colour in basalt near Keilor, Gisborne, &c. Agalmatolite.

Steatite (Magnesian Soapstone).—Is very frequent in decomposed basalts; also in cracks and joints of the silurian rocks, and sometimes of quartz reefs. In the neighbourhood of Strathloddon it occurs as a narrow vein in white silurian mudstone, close beneath older pliocene gold drift. Specimens from this place are nearly translucent, closely resembling pure stearine in appearance. A pseudomorph of this mineral after quartz has also been found in the same locality. Steatite: Magnesian Soapstone. Allophane, Halloysite, Meerschaum (?).

The partly-decomposed basalts and the clays of the gold drifts and fossiliferous tertiaries around the coast are generally very rich in nodules and veins of amorphous silicates of alumina and magnesia, of uncertain, *i. e.*, variable, composition; specimens resembling "allophane," "halloysite," "meerschaum," &c., have been found at many places.

Talc.

Talc.—Occurs in thin veins of a silvery-white colour and fine lustre in Selwynite, near Heathcote.

Chlorite.

Chlorite.—Is found very sparingly as thin scaly coatings in Lady Gully Reef, and in a reef at Wattle Flat, near Castlemaine, also in Blacksmith's Gully Reef, Fryerstown, sometimes enclosed in rock-crystal; in this manner it also occurs at Beechworth, and other places. On the top of the high range, N.E. of Yandoit, it occurs frequently as scaly coatings in the slate and sandstone beds, which form the walls of the numerous quartz reefs traversing the range.

Muscovite Oblique Mica.

MICAS.—*Muscovite Oblique Mica.*—Besides forming one of the principal components of our granites and grey feldspar porphyries, this species is found in fine light-green oblique crystals in sandstone at Beechworth; also in large plates of dark brown, or sometimes tortoise-shell colour at the Glenelg, in the neighbourhood of Harrow; in the granite hills near the Anakies, Geelong; at Reid's Creek, Beechworth, and other places.

Biotite: Hexagonal Mica.

Biotite (Hexagonal Mica).—Occurs in large hexagonal plates of dark-brown colour in a basaltic dyke, which forms the hanging wall of the Eureka Reef, near Castlemaine. The silvery-white mica of a diorite porphyry dyke at the Castle Reef, Raspberry Creek (Woodspoint district), may also perhaps belong to this species.

Rubellane.

Rubellane.—Is met with in small very regular hexagonal tables of a fine brownish-red colour, in decomposed basalt, in the neighbourhood of Vaughan and Footscray. It seems, according to all appearances, to have originated from the decomposition of *olivine.*

Bucholzite, Fibrolite (?)

Bucholzite Fibrolite (?).—A mineral of fibrous massive—in places distinctly prismatic structure—and with bright pearly lustre, was brought by the late Mr. M'Millan from the granite of the Moroka Valley, Gippsland. Besides the outward character, its hardness and behaviour before the blowpipe accord well with those given for *fibrolite,* or *bucholzite.*

Hornblende.

Hornblende.—Only the common black variety is at present known in Victoria. Large, well-developed crystals (Figs. 22 and 23 [a b],) and crystalline pieces, with splendent cleavage planes, occur in abundance, associated with transparent oligoclase, in the scoriaceous basalt of the Anakies. An analysis of a specimen of the same by Mr. R. Daintree afforded—

Silica	41·367
Sesquioxide of Iron	20·350
Alumina	20·900
Lime	8·181
Magnesia	6·834
	97·632

Large, though imperfect crystals, associated with hexagonal plates of brown mica, occur in a basaltic dyke at the Eureka Reef, Castlemaine; and small prismatic crystals are also occasionally met with in the granite of Mount Alexander, Lancefield, M'Ivor, and other places.

Rock—or Mountain—Leather.—Occurs occasionally in yellowish-white, semi-transparent, thin, paper-like laminæ, or sheets, in the joints and crevices of the white silurian mud-slate which forms the bottom of the older pliocene gold-drift of Kangaroo Hill and Table Hill, near Tarilta. Pieces of this mineral have been found nearly as large as a man's hand, thin as fine paper, and flexible as leather. At first sight it might easily be mistaken as of vegetable origin (lichen); its behaviour in fire, which has no effect upon it beyond burning it perhaps a little brighter, shows, however, its true mineral character. Rock or Mountain Leather.

Augite.—Except that this mineral would theoretically form one of the principal components of our basalts, it can, as such, be very seldom recognised. In the dolerite, at Malmsbury, it occurs in crevices and cavities in small, black, acicular crystals, associated with small plates of labradorite and iron-glance, also in imperfect crystals and crystalline pieces in the scoriaceous basaltic lava of a point of eruption near the Black Hill, Kyneton. From its appearance, cleavage, &c., and the result of a quantitative analysis by Mr. C. Newbery, there is also good reason to suppose that the dark-green component of the greenstone (*diabase*) of the Barrabool Hills, near Geelong, is *augite*. Augite.

Obsidian.—Button-shaped and sphæroidal pieces of this mineral, from a quarter of an inch to several inches in diameter—the larger ones sometimes hollow inside—are found abundantly distributed over the surface of the basaltic plains round Mount Elephant, Mount Eeles, &c., also, strange enough, over the tertiary mud-plains of the Wimmera, far removed from any known basaltic craters, or points of eruption. It occurs in a basalt quarry near Geelong, and in the basalt of Broadford, in patches and irregular veins of an inch and more in thickness, of generally a black to brown, sometimes a bluish-grey colour. Small button-shaped pieces have also been found in the post-pliocene gold drift of Spring Creek, near Daylesford. The following are results of analyses by Mr. C. Newbery of specimens of this mineral from Geelong and the Wimmera plains :— Obsidian.

	Wimmera Specimen. Black glassy lustre. Specific gravity, 2·47		Geelong Specimen. Black to brown. Specific gravity, 2·41		Geelong Specimen. Bluish-grey. Specific gravity, 2·36
Silica	73·70		72·23		68·45
Sesquioxide of iron	6·08		2·28		7·21
Alumina	4·99		16·43		5·38
Lime	4·20		3·17		8·11
Magnesia	0·10		2·12		9·03
Protoxide of Manganese	—		—	Peroxide of Manganese	0·50
Titanic acid	—		—		0·30
Soda	5·20	Soda and Potassa	4·65	Soda and Potassa	7·36
Potassa	4·83		—		—
Loss by ignition	0·55		0·13		—
	99 65		101·01		98·34

Pitchstone (?).—Largish irregularly-shaped patches of a mineral closely resembling "*pitchstone*" in lustre and general outward character have been found in the basalt at Ballarat. Pitch-stone (?)

Olivine: Chrysolite.

Olivine (Chrysolite).—This mineral is so common in the newer basalts (except where the latter appear as true "dolerites") as to deserve to be regarded as an essential constituent of the rock. It generally appears disseminated in small angular grains of light apple to blackish-green colour, but at many places, especially in the neighbourhood of basaltic craters and points of eruption (Mount Franklin, the Anakies, Gisborne Hill, the Warrion Hills, &c.), it occurs in irregularly shaped, or sometimes sphæroidal, masses, of both fine and coarsely-granular texture, and from one to five, in some instances (Anakies), to even twelve to eighteen inches, in diameter. Crystals have not been observed as yet. An analysis by Mr. Daintree of light-green olivine from the Anakies yielded:—

Silica	42·60
Protoxide of iron	7·36
Magnesia	50·00
	99·96

According to all appearances this mineral easily decomposes through atmospheric influence, assuming at first chatoyant colours, then turning to reddish brown, and ultimately, beneath a thin coating of hydrous oxide of iron, changing to a brownish-red mica ("Rubellane").

Tourmaline: Schorl.

Tourmaline (Schorl).—Is a very common accessory of the granite of the Maldon, Beechworth, Dandenong, St. Arnaud, Mount Alexander, &c., districts, and occurs also abundantly, often in prisms, more than one inch in diameter and two to three inches long, in the gold drifts that lie, or have in earlier tertiary times lain, within the drainage area of those granites. Fine crystals occur in the Dandenong Ranges, in a porphyritic vein in the granite near Baynton's station, Campaspe River, in the Ovens district, at Wilson's Promontory, Berwick, &c. (Figs. 24 [a & b].) Near Beechworth pebbles have been found in the gold drift, which consist, singular to say, of a dense, flesh-coloured chalcedony, thickly interlaced with needles and well-developed prisms of schorl. At Maldon and in the Ovens district, radiating sphæroidal masses have been found, from two to six inches in diameter. Near Peter's diggings, St. Arnaud district, it occurs in a narrow zone of metamorphic silurian sandstone, running along the granite boundary, in such abundance that the rock might not inaptly be termed, *schorlrock*. A crystal of transparent green tourmaline, found in the bed of the River Yarra, is in the possession of Mr. R. Brough Smyth, and others, from the Beechworth district, are in the collection of Dr. Bleasdale.

Topaz.

Topaz.—Occurs (in tolerable abundance in crystals (Fig. 25 [a, b, c]), and rolled pebbles up to walnut size, colourless, or light yellow, transparent, on French and Flinder's Islands, Bass' Straits). In the gold drifts of Dunolly several rolled specimens have been found above one inch in diameter, showing a thin, colourless, or glass-like shell, round a nucleus of light, limpid sky-blue. Similar blue and white topazes, though of small size, occur also very frequently at the Woolshed, Sebastopol, Eldorado, and Reid's Creeks, Beechworth, and more rarely at Pleasant Creek and Ararat, and in the Castlemaine and Sandhurst districts. A small crystal, beautifully clear, like the finest rock crystal, and exhibiting all the planes of Fig. 26, has lately been found at Beechworth. Pink-coloured specimens are also reported from this locality.

Zircon, Hyacinth, (Jargon).—Is generally abundant in the gold drifts, but more especially so at the Blue Mountain goldfield, Kangaroo, near Tarilta; Guildford, Daylesford, Ballan, Upper Yarra, Beechworth, &c. Specimens from the first-named locality, though small, are nearly always transparent, more or less perfect crystals, and of a fine blood-red colour, sometimes approaching to carmine. The drifts of the Hard Hills, Campbell's Creek, near Castlemaine; as well as those of Yandoit, Guildford, Taradale, &c., afford abundance of small transparent colourless grains, showing adamantine lustre and brilliancy. These are, no doubt, what would be called "*Jargons*" in Ceylon. The zircons (hyacinths) from Beechworth, Daylesford, and the Upper Yarra are often very fine, and from their size and colour might be valuable as gems. Small crystals are sometimes found at Daylesford, which are very interesting, as they exhibit dichroism, appearing colourless or very light bluish-green at right angles to the prism, and of a beautiful lustrous emerald-green, with a tinge of blue in the direction of the main axis of the crystals. As regards the general form of the latter from all localities mentioned, it is very simple—dimetric octahedron, with either first or second prism, the latter the most frequent, or, rarely, both in combination. (Figs. 28-30.) Beechworth is the only locality where more modified crystals have been found. (Figs. 31 and 32.) At the Blue Mountain goldfield, perfect dimetric octahedrons are not rare (see Fig. 22). It seems probable that the zircons of Daylesford, Guildford, Ballan, the Blue Mountain, &c., are derived from decomposed basalt, whilst those of Beechworth, the Upper Yarra, &c., have had their origin in the granitic rocks of those districts. Zircon Hyacinth: Jargon.

Garnet (Almandine).—"Almandine," or "Precious Garnet," occurs very frequently in the gold drift of Reid's Creek, Woolshed Creek, Sebastopol, and El Dorado, Beechworth district, also embedded in small roundish grains in a dioritic dyke near Longwood, and in an euritic dyke on Lady Franklin Mountain, Barnawartha Creek. The Beechworth specimens are generally roundish grains, hardly exceeding a small pea in size, and their colour is a splendid deep claret-red, with a tinge of blue (pigeon blood). They would no doubt be valuable as gems if of larger size. Garnet Almandine.

Common Red Garnet.—Several specimens have been found in the post-pliocene gold drift of Barker's Creek, near Castlemaine, of a mica schist like rock, with crystals (trapezohedrons) of a brownish-red, semi-transparent, garnet, embedded. The original place of occurrence—*i.e.*, the rock *in situ*—has not been discovered as yet. Specimens of mica schist full of similar small garnets were lately brought from near Mount Murchison, on the Darling.

CORUNDUM.

Sapphire.—Is very common in the gold drifts of Beechworth, Daylesford, Vaughan, the Blue Mountain, Upper Yarra, Mount Eliza, Inglewood, &c., varying in size from a pin's-head to a walnut and larger, and showing all gradations from colourless or light-blue to a clear deep-blue colour. At Daylesford, where the largest stones have hitherto occurred, their colour is generally a mottled or cloudy mixture of transparent deep blue, with patches of various shades of green and opaque grey or black; but several specimens have also been found with a fine, uniform bluish-green colour—one of these (in the possession of Mr. Milner Stephen), rather impaired by small cracks, being nearly one cubic inch in Corundum: Sapphire.

size. From the Upper Yarra a stone of a chrysoberyl-like green colour *(Oriental Emerald)* was lately exhibited in Melbourne. This gem (now in the possession of Dr. Bleasdale) has been cut, and being quite free from cracks and weighing several carats, is valued at about £50. At Beechworth, sapphires are also said to be found which show a light amethyst colour *(Oriental Amethyst)*. Crystals of sapphire are pretty frequent, commonly in six-sided, often barrel-shaped prisms, with pearly-white, somewhat rounded basal planes; sometimes they show also the hexagonal prism, with pyramid and planes of a rhombohedron (see Fig. 33 and 34). The blue colour of the lower part of such crystals often changes to colourless near the top. Hexagonal plates above half an inch in diameter are not rare at Daylesford, being parts of large crystals broken in the direction of the chief cleavage plane.

Oriental Emerald.

Oriental Amethyst.

Oriental Ruby.

Oriental Ruby.—Appears to be very rare, only one very small specimen of a fine magenta colour from the Mount Eliza goldfield having as yet been identified.

Asteria: Star Sapphire.

Asteria (Star Sapphire).—Several of these interesting stones have been discovered at Beechworth by Dr. Bleasdale. Their ground colour is grey, or bluish grey, and the six-rayed stars are well developed.

Adamantine Spar.

Adamantine Spar.—Occurs often in washed grains in the drifts of the Blue Mountain and Beechworth districts, showing a hair-brown colour, with a silky opalescent lustre on the chief cleavage plane. Corundum of an opaque dull white (quartz-like) greyish-brown, or occasionally peach-blossom or magenta colour, in irregular roundish or globular pieces up to nearly a pound in weight, occurs not unfrequently at Reid's Creek, Woolshed, Sebastopol, Sheep-station Creek, &c., Beechworth district. The magenta-coloured variety has been named "Barklyite" by Mr. Milner Stephen, after Sir Henry Barkly, a former Governor of Victoria.

Barklyite.

Black Corundum.

Black Corundum.—Occurs abundantly in the drifts of nearly all the goldfields in half-angular or roundish pieces, often near the size of a large bean. It shows conchoidal fracture, very rarely indistinct crystal and cleavage planes, its specific gravity is 3·98, and its hardness sometimes over 9—scratching the sapphire. According to Mr. J. Cosmo Newbery, the chemical composition of black corundum from the Dandenong goldfield is:—

Silica	5·35
Alumina	67·37
Sesquioxide of iron	28·04
Magnesia	0·30
Water	0·61
	101·40

Black Spinel: Pleonaste.

Black Spinel (Pleonaste).—This species was first identified by Mr. Brough Smyth in "heavy sand" brought from the Upper Yarra, where it occurs sparingly in the gold drift, associated with zircon, sapphire, &c. It has also been found at the Blue Mountain and Ballan (see Fig. 35).

Diamond.

Diamond.—The genuineness of the occurrence of this precious stone at the Beechworth goldfield has up to late years been doubted by many persons here as well as in England; the repeated finds, however, at the Woolshed, El Dorado, Sebastopol, Reid's and Worragee Creeks, of stones

of fine water, and of weights ranging from $\frac{1}{8}$ to, in one or two instances, $2\frac{1}{2}$ carats, have placed the matter entirely beyond doubt. Fifty-six stones have already (according to the mining statistics issued by the Mining Department) been found, of which fifteen alone came from the sluicing claim of Mr. Finn at the Woolshed, their weights varying from $\frac{1}{2}$ to 1 carat. The colour of the Woolshed specimens was mostly a pale straw yellow, a few showed a slight tinge of green, and the others were quite colourless. The "octahedron," with small planes of the "trisoctahedron" (Fig. 36), appears to be the principal crystalline form of the Beechworth diamonds. One of the larger stones, exhibited some time ago, was a nearly perfect trisoctahedron (Fig. 37). Several specimens have also been found showing quite a globular form, with a rough crust-like surface.

Considering that the diamond often occurs under conditions (covered with a ferruginous crust, &c.) rendering it unrecognisable, except to the most experienced eye, and that all those mentioned have been accidentally found during the operation of "panning off" the gold, after all pebbles over about a quarter of an inch in size have been removed by sieve, it is not improbable that not only a number of small ones, but more especially the larger, and therefore far more valuable gems, are annually overlooked, and that a regular systematic search, similar to that carried on in the Ural, the Brazils, and East Indies, might prove a successful undertaking.

QUARTZ—VITREOUS VARIETIES.

Quartz.—Is, as the "massive variety," the most common of colonial minerals, represented by the thousands of auriferous and non-auriferous reefs that traverse our silurian rocks, and also as extensive beds of quartz-rock—some near 40 feet in thickness—in the lower miocene tertiary formation. It is partly, and perhaps more commonly white opaque, or what might be called "milky quartz," partly vitreous, semi-translucent. Sometimes it shows, especially in veins traversing the granite, a greasy lustre—"greasy quartz;" in the Belltopper Reef, Taradale, it is quite sugary, or fine granular; in some of the St. Arnaud and Heathcote reefs, cellular; and in most auriferous reefs there occur opaque patches of a uniform brown or yellow colour—"ferruginous quartz." The term "good looking" is generally applied by the gold miner to quartz of a seamy, mottled, or marble-like aspect (irrespective of there being any gold embedded), produced by bluish, greenish, or brownish-coloured veins, streaks, and patches, due to the decomposition of pyrites or other ores.

Quartz: Vitreous varieties.

Druses of crystals (generally the hexagonal pyramid, with only a small indication of the prism) occur in all reefs, yet not, as one would have expected, in such abundance and beauty as in those ore-lodes of European mining countries, where quartz, as it does here, forms the lode-stone. Fine, very perfect, opaque white crystals (double hexagonal pyramid, with narrow planes of the prism) occur in an elvan dyke near Baynton's station, on the Campaspe River; also, though less symmetrical and perfect, in several felspar-porphyry dykes near Mount Tarrangower, and in the Timbillica Valley, Gippsland. In quartz veins traversing the granite, near Pigeon Hill, Tarrangower, specimens of the so-called "Hauben" or "Hood quartz" (Fig. 38 a & b.) are occasionally found, and in cavities of the granite, near Baynton's station, very fine crystals occur (pyramid and prism), some near two inches in length and three-quarters of an inch thick, composed of a colourless envelope, with

rather roughish dull faces surrounding a white opaque nucleus, formed by a small crystal, in most instances hardly one-third the size of the whole specimen. (Fig. 39.)

Rockcrystal.

Quartz occurs also, though generally speaking only in moderate abundance, in a transparent crystallized state, and in coloured varieties fine enough to be cut for jewellery. Thus we have: *Rock Crystal*, in fine crystals, occasionally 6 to 8 inches in length and 3 to 4 inches in thickness, embedded in red clay, in the Blacksmiths' Gully Reef, Fryerstown. Some of the crystals found are rich in rare planes; others show the prism, surmounted by a rhombohedron, and the generality, though perfect all round, are developed in a peculiarly unsymmetric manner. (Figs. 40-53.)

Curved and twin-like crystals are also frequent, and several have been found with filamental tufts of *chlorite* in the centre. In the quartz of Dunolly, Sandhurst (Alabama Company), and Inglewood, druses of rock crystal of superior size and brightness are not uncommon. Fine crystals occur also in the reefs of Woodspoint and Raspberry Creek, and in Blacksand Creek, Beechworth. Cavities, with groups of small, colourless crystals, may, perhaps, be found in all quartz reefs.

Pebbles of rock crystal, though seldom of sufficient size to make them valuable, are frequently found in the older and newer pliocene gold drifts of most of the goldfields, more particularly Beechworth, Tarrangower, Guildford, Avoca, White Hills (Bendigo), &c.

Smoky Topaz and Cairngorm.

Smoky Topaz and Cairngorm.—Occur at Beechworth, Tarrangower, the Upper Yarra, &c., especially in quartz veins traversing the granite; also, as pebbles, often several inches in diameter, in the drifts, wholly or partly derived from such veins: the drifts of the Beechworth creeks, Blacksand Creek, &c., and that of the Bradford lead, Tarrangower, deserving special notice.

Amethyst.

Amethyst.—Is met with in small, perfect crystals (double hexagonal pyramid, with prism), sometimes of very fine colour and great brightness, at Sebastopol and El-Dorado, Beechworth, partly in the drift, partly in narrow veins, traversing the granitic rock bottom. It also occurs in tolerable abundance in the drifts of the Bradford lead, Tarrangower: the light colour of specimens from this locality being often of such a character as to make the designation *Rose Quartz* more applicable.

Prase.

Prase.—This variety is of rather rare occurrence, being sparingly met with in Lady Gully Reef, Castlemaine, and in some of the reefs near Heathcote, and those specimens which have been found possess no points to render them of any value for the lapidary.

CHALCEDONIC VARIETIES.

Chalcedonic varieties: Chalcedony.

Chalcedony.—Is tolerably frequent, as mammillary coatings of cavities in the basalt, near Keilor and Sunbury. Nodules and pebbles are found in great abundance along the shore of Phillip Island, derived from veins in the older basalt of that locality. The generality of the specimens are of bluish-white colour, with fine, opaque white seams, which consist of carbonate of lime. Pebbles of chalcedony are also frequent in the drifts of the Beechworth creeks,

and fine specimens have been found at Landsborough. Some fine geodes of chalcedony have been brought by the late Mr. M'Millan from the Moroka Valley, Gippsland. Cut in halves, they all present a pentagonal shape, and exhibit partly concentric alternating striæ, partly irregular mixtures of pale-bluish and opaque white chalcedony, each of the angles of the pentagon having apparently served as channels of infiltration for the siliceous water. In Spring Creek, Beechworth, a very interesting discovery was made some time ago by Mr. Dunn, in a vein of felspathic clay traversing granite, and overlain by auriferous drift. The whole of this clay vein is interspersed with thin, glass-like plates, scales, angular chips, and numerous unsymmetric, sharp, angular polyhedrons ("pseudo-crystals") of light yellow to dark brownish-red chalcedony (carnelian ?) A great number of these pseudo-crystals, which are mostly hollow, contain fluid and air-bubbles in the cavity; the size of the bubbles varies from a pin's-head to that of a bean, and that of the crystals from a quarter of an inch to three inches cubic. Several specimens have been found containing each two, and some three fluid cavities, with air-bubbles; others, with sharp knife-like edges all round, yet hardly one-eighth of an inch thick in the centre, show each a large bubble, traversing a cavity, occupying nearly two-thirds of the length and breadth of the specimen. In most of the specimens the inner walls of the cavities are coated with small quartz crystals, in the others they are quite smooth, and it is clearly observable that the air-bubbles of these latter travel far slower than those of the former—a circumstance which might point to the probability of the fluid in the smooth cavities being still strongly charged with "silicic acid," which in the others has crystallized out. The fluid of one of the stones with lively air-bubble—*i.e.*, with quartz crystals inside—on being subjected to evaporation by Mr. George Foord, produced a hardly-perceptible deposit of fine radiating crystals, resembling those of chloride of magnesium.*

Carnelian.—Occurs sparingly as small pebbles in the drifts of the Beechworth creeks, the Yarra basin, and several parts of Gippsland, also in the drifts of the Murray river, near Woodonga. Carnelian.

Agate.—This stone is very frequent in the localities just mentioned, especially at the Woolshed, Sebastopol, and El Dorado, Beechworth. Specimens of fine size, colour, and pattern are very often found; banded varieties, the bands arranged in the peculiar zig-zag shape, "Fortification Agate," as also "Landscape," and "Moss Agate," being not rare amongst them. The Cape Otway coast has also furnished some very fine agates. Agate.

Catseye, Onyx, and Sardonyx.—Have been reported from Beechworth and the Yarra basin, but seem to be very scarce. Catseye, Onyx and Sardonyx.

Flint.—Is found abundantly scattered through the sands along the Cape Otway and Warrnambool coast-line, probably derived from tertiary formations. Flint.

Silicified Wood.—Occurs abundantly in large blocks on the Barrabool Hills and the banks of the River Barwon, near Geelong, on the Sutherland's Creek, near Maude, and in many places of the Bacchus Marsh district, also in several localities in Gippsland. Silicified Wood.

* It is a curious fact that the chalcedony of these "Water Stones" has a hardness above 8, as the sharp edges scratch topaz easily.

JASPERY VARIETIES.

Jaspery Varieties: Jasper.

Jasper.—Is very common as pebbles on the coast of Cape Otway, near the embouchure of the Gellibrand River, and occurs also occasionally in the drifts of the Yarra basin and Beechworth.

Hornstone and Chert.

Hornstone and Chert.—Are abundantly met with in veins as sharp-angular, splintery pieces of a greyish-white and blackish colour, along the boundary of the dioritic greenstone in the Lancefield district; being there evidently a product of metamorphic action.

Lydianstone: Touchstone.

Lydianstone, Touchstone.—Occurs very frequently in the drifts of the Beechworth creeks, also in the pebble deposit near the mouth of the River Gellibrand, Cape Otway coast. Narrow veins in the silurian rocks occur in the neighbourhood of dioritic greenstone near Wickliffe; also, it is said, at Joyce's Creek, near Newstead. Specimens from Beechworth have been tested by jewellers and pronounced to be of superior quality as "Touchstones."

OPAL VARIETIES.

Opal. Hyalite. Semi-opal. Opal-jasper. Wood-opal.

Opal.—With the exception of the "precious opal," reported by Dr. Bleasdale to occur at Beechworth, all the other varieties of this mineral are of frequent occurrence. Thus, *Hyalite* is very common in beautiful drop-like incrustations of cavities in the basalt near Kyneton, Malmsbury, Gisborne, Baringhup, and many other localities. *Semi opal* occurs in large nodular masses of a brownish, greyish, or greenish colour, in the basalt near Melbourne, Bacchus Marsh, Gisborne, Keilor, &c. *Opal-jasper* is met with in the basalt near Melbourne, and Riddell's Creek. Not so abundant as the former. *Wood-opal* occurs in large pieces in the Bass River, Western Port; in the Grampians, and in the pliocene gold drifts of several of the leads at Daylesford, Ballarat, &c.

CARBONATES, SULPHATES, PHOSPHATES, CHLORIDES.

Calcite: Calc-spar, Carbonate of Lime.

Calcite, Calcspar (Carbonate of Lime).—This mineral, so frequent in other mining countries, is very rare in the goldfields of Victoria. In the Lennox Reef, Tarrangower, it occurs with the auriferous quartz in druses of obtuse light-yellow rhombohedrons, frequently dotted over with small cubes of iron pyrites. Specimens are also met with showing at the obtuse apex of every rhombohedron a small indentation, occupied by either a single, or more frequently a group of minute crystals of the latter mineral. Fine clear crystals of calcite (scalenohedron, with two rhombohedrons, Fig. 54) are found associated with *chabazite* in the basalt from the shaft near Degraves's mill, Malmsbury; and, though more sparingly, druses of deep-yellow, very acute rhombohedrons—*Dogtooth Spar.* Small crystals, perfect all round, composed of an acute scalenohedron, terminated by a rhombohedron (Fig. 55), are also sometimes found embedded in a bluish-green soapy clay in the basalt of this locality. Fine rhombohedrons of a rose-red colour, and in the angles closely approaching the main or cleavage rhombohedron, occur in the amygdaloidal basalt of Phillip Island, associated with, or often covering *analcime* and *natrolite;* sometimes acicular crystals of the latter are found capped by a calcite rhombohedron. In cakes of freshwater limestone in the Muckleford Creek, near Newstead, small saddle-shaped rhombohedrons of calcite are found associated with acicular crystals

of "arragonite." Narrow, irregular veins of white calcite are common, associated with the carbonaceous strata of the Barrabool Hills, Cape Otway, Western Port, and Traralgon. At Geelong they occur in the conglomerate drift beds which are interstratified with the carbonaceous rocks of the Barrabool Hills, near Geelong, and appear in fine sections along the banks of the River Barwon.

Marble.

Marble.—Large nodular masses of "marble," up to several tons in weight, and of tolerably good quality, closely resembling superior "Sienna marble," are found embedded in newer pliocene calcareous clays between high and low water mark of Corio Bay, Geelong. The ill-success of a company some time ago formed to work this marble was mainly due to the sparingly scattered manner in which the blocks occur, the promoters of the company having no doubt supposed it to exist in beds. A very handsome marble occurs at Yering in the upper silurian; there is a cave existing in it 120 feet in depth. A kind of *shell-marble* is also found in the miocene tertiary near Maude.

Common Limestone, Marl, &c.

Common Limestone, Marl, &c.—Compose extensive beds in the tertiaries near Geelong, Cape Otway, Point Nepean, &c.; also in the upper silurian at Buchan and Bindi, East Gippsland; near Mansfield on the Devil's River, &c. As "freshwater limestone" it occurs as beds near Geelong (Duck Ponds, Lime-burners' or Galena Point, &c.), and near Bacchus Marsh; also in irregular cakes, often several feet in thickness, along the Limestone Creek near Mount Franklin, the Muckleford Creek near Newstead, at several places in the Charlotte plains, and the Murray river basin, &c. Nodular concretions, often many pounds in weight, occur generally in great abundance in basaltic detritus, especially in the brownish tough clays along basalt escarpments. At the Mia Mia and Sandy Creek, Tarrangower, it forms at several points the cementing medium of the gold drift, and contains occasionally alluvial gold embedded. Limestone suitable for hydraulic mortar ("hydraulic limestone") occurs at Mansfield, and nodules of this kind ("septaria") are abundant in the lower miocene and upper eocene tertiary beds of the Geelong and Schnapperpoint districts. The following are results of analyses by Messrs. Wood, Daintree, and Newbery of limestones from several of the localities above mentioned:—

Hydraulic Limestone.

	I.	II.	III.	IV.	V.	VI.
Carbonate of Lime	87·72	63·18	84·438	75 200	82·01	54·7
,, Magnesia	0·23	0·36	trace	3·000	1·50	—
,, Iron	2·29	2·01	—	—	3·47	—
,, Soda	—	—	1·74	—	—	—
Sesquioxide of Iron	—	8 33	2·93	3·000 (with Alumina)	—	—
Alumina	—	—	1·13		—	—
Soluble Silica	7·61 (with Insoluble Clay)	27·91	7·325	15·790	0·72	2·0
Insoluble Clay, &c				—	10·42	43·3
Phosphoric Acid	—	—	trace	—	—	—
Water	—	—	1·518	—	1·81	—
Organic Matter	—	—	—	—	0·05	—
	97·85	101·79	99·081	96·999	99 98	100·0

Analyses by Mr. C. Newbery.

I. Blue limestone, from near Buchan, Gippsland.

II. Yellow limestone, from Barwon Heads.

III. Limestone, from cliffs at Curdie's Inlet: white granular powder. A little soda was dissolved on boiling with water, due, perhaps, to the spray of the waves breaking on the cliffs.

Analysis by Mr. R. Daintree.

IV. Siliceous limestone, from Fenwick's Gully, on the Queenscliff road. Forms the typical rock of the upper miocene series.

Analyses by Mr. Charles Wood.

V. Sample of hydraulic limestone, from near Mansfield; forms, according to experiments, a fine hydraulic cement.

VI. Septarian limestone, from Schnapperpoint; forms a moderately good hydraulic cement.

Arragonite: Carbonate of Lime.

Arragonite.—Is very frequent in druses of radiating acicular crystals in cavities of the newer pliocene basalts. It also occurs occasionally, of similar form, in hollows of the older pliocene gold drifts near Talbot, Taradale, Daylesford, &c., being no doubt a product of infiltration from the basalt which at those places covers the drifts. Druses of small transparent, terminally well-developed, generally compound crystals (Figs. 56 and 57) (a rarity with those from the basalt), occur in hollows of a freshwater limestone, which forms cake-like masses in the bed of the Muckleford Creek, near its junction with the Loddon river. In the basalt of Kyneton, Malmsbury, and Taradale, white nodules of *arragonite* are occasionally met with; these when broken show a fine radiating structure which might easily cause them to be mistaken for "*mesotype*," especially some, that do not effervesce if touched with acid on the outside, on account of an extremely thin glassy coating of "*hyalite*," a mineral which is frequently found associated with *arragonite* in the localities mentioned.

Magnesite: Carbonate of Magnesia.

Magnesite (Carbonate of Magnesia).—This mineral is tolerably abundant in the "kaolin" deposit of Bulla Bulla, near Keilor; at Heathcote, and generally in the tertiary clays near Geelong, Bacchus Marsh, Western Port, &c.; also in the surface soil along the banks of the Loddon river, near Newstead, forming nodules of all shapes and sizes, from that of a pea to several inches cubic. According to analysis these nodules are, however, not composed of pure carbonate of magnesia, but contain small variable proportions of carbonate of lime, carbonate of iron, and clayey matter. A peculiar occurrence of very pure magnesia is observable at the Hard Hills, near the junction of Jim Crow Creek and the Loddon river. It appears like an annular outcrop of a bed of nearly one foot in thickness round the base of a small hillock, composed of older pliocene gold drift, but extends barely a few inches beneath the surface. This outcrop consists of an aggregation of nodules of all sizes, from several inches diameter to even fine roundish grains, like oolitic sand. Some of the nodules are extremely hard and homogeneous, but the generality consist of roundish particles of pea-size, with obscure rhombohedral planes, sometimes closely, but in most cases very loosely adhering together. The origin of the mineral appears to be due to the action of the carbonic acid of the atmosphere on a seam of white soapy clay, which contains a large percentage of silicate, and perhaps hydrate of magnesia, and would crop out where now the *magnesite* appears. Where the atmosphere could have no access to the clay, there is a total absence of *magnesite*, whilst on the other hand, in places where the clay has been exposed to its influence, even in the most recent times—for instance, in the drift heaps from several shafts sunk on the hillock—the small white grains appear in profusion, like white sand artificially strewn over the surface. *Magnesite* has lately been profitably used by the ærated bread companies for the production of pure carbonic acid, and is likewise in demand for the production of "fluid magnesia."

Dolomite: Brown Spar.

Dolomite, Brown Spar.—Is tolerably abundant in drusy coatings of small light yellow, generally saddle-shaped rhombohedrons in joints and fissures of the metamorphic sandstone, which forms the walls of Lisle's Reef, Mount Tarrangower, often associated with *spathic iron* and *heulandite*. It also occurs massive in some of the reefs of the Howqua River district.

An analysis of a specimen from this locality (reef at Mount Timbertop), made by the late Mr. C. H. Wood, gave the following results :—

Carbonate of lime	57·810	gives nearly as formula :—
Carbonate of magnesia...	28·387	$5\ Ca.O.CO_2 + 3\ MgO.CO_2 + Fe.O.CO_2$
Carbonate of iron	12·895	
Siliceous residue...........	1·014	
	100·106	

Ankerite.—In the decomposed basalt of Phillip Island narrow veins and irregular patches of a dense light greenish-yellow mineral occur in some places, which proved by analysis closely related to "*ankerite.*" A peculiar variety of brownspar (?) occurs in the basalt at the Barfold Falls, Campaspe River. The mineral bears outwardly a close resemblance to chalcedony, forming nearly glassy-looking botryoidal crusts and globular nobs of a bluish or yellowish-white colour, whilst its fine concentric radiating structure, mostly accompanied by a change to a darker colour—both which can be especially well seen on weathered specimens—reminds very much of *sphærosiderite.* According to analysis by Mr. C. Newbery, it varies slightly in composition according to colour, the darker portions containing most iron and manganese. An average specimen gave :— Ankerite.

Carbonate of lime..	72·43
" iron	20·65
" magnesia	5·00
" manganese..	1·92
	100·00

On comparison of this composition with those of varieties generally classed under dolomite, a very great difference will be observed, especially as regards lime and magnesia; and it may therefore—taking also its peculiar structure into consideration—not be unjustifiable to call this mineral *Ferro-Calcite.*

Ferro-Calcite.

Its hardness is 3·5 ; specific gravity, 2·86 ; it is translucent, and gives before the blowpipe, with borax and salt of phosphorus, slightly iron-coloured beads ; alone, it decrepitates, fuses on the edges, becomes black, and is attracted by the magnet. It is probable that, from its structural resemblance to sphærosiderite, the *Ferro-Calcite* represents, so to speak, a part-pseudomorph, after that mineral, by exchange of carbonate of lime for carbonate of iron.

Selenite, Gypsum (Sulphate of Lime).—Occurs abundantly in thin veins, lenticular patches, and concretionary masses in the upper miocene friable sandstone and clay-beds along the coast, from Jan Juc Creek to Point Addis, near Geelong, and in the Cape Otway district. It is further found in considerable abundance in the tertiary beds all over the Murray basin ; particularly the north-western part, in the saline deposits of the numerous lakes and lagoons studding the country ; also in the raised estuaries and swamps near the sea, for instance : Batman's Swamp, near Melbourne, &c. In the goldfields, lamellar gypsum is often found in the brownish and blackish clays, filled with vegetable matter, which overlie the gravel (newer pliocene near Mount Consultation, Castlemaine; Sandy Selenite Gypsum: Sulphate of Lime.

Creek, Tarrangower; Ballarat deep leads, &c.). The mineral is generally of a pale yellow or white colour, and in most instances transparent. Single and twin crystals, many above one inch in length and breadth, and some exhibiting, besides elliptical and lenticular shaps, all the forms given (Figs. 58-65), are especially abundant in Batman's Swamp and in the deposits of the briny lakes of the Murray basin; also in the heaps of excrement of bats, met with in many basaltic caverns. An interesting occurrence in several parts of the western district, and in the banks of the River Murray, is that of casts of shells (upper miocene), consisting of light honey-yellow, transparent *selenite*.

Heavy Spar: Sulphate of Baryta.

Heavy Spar (Sulphate of Baryta).—This mineral appears to be extremely rare in Victoria, having as yet in fact only once been found in very small quantity in the claim of Mr. Fordred, on Swiper's Reef, Maldon. It was obtained some 40 feet beneath the surface, in cracks and crevices of the quartz, partly in fine, nearly colourless, transparent tabular crystals (some, near three-quarters of an inch square), partly in drusy coatings of small, saddle-shaped crystals, not unlike spathic iron-ore, as commonly found in ore-lodes. The general form of the larger crystals is a rhomboidal table, with one pyramidal and five prismatic replacements at the obtuse, and one prismatic with three pyramidal ones at the acute edges of the rhomboid (Fig. 66 $^{a \,\&\, b}$). These smaller planes are, however, partly ill-defined, the edges looking rounded off, or as if waterworn. Some specimens show a number of crystals compounded with their acute edges in one plane, the whole presenting the appearance of a thin disc, deeply scalloped round the margin (Fig. 67). The basal cleavage is very perfect, and indicated by deep horizontal striations on the prismatic faces. Most of the larger crystals show opaque concentric lines on the basal planes, and very frequently also cloudy patches, which both originate from very fine quartz-sand, seemingly enveloped during the act of crystallization. The specific gravity of the mineral—determined of several small transparent crystals—proved to be in the mean 4·696, and its composition pure sulphate of baryta, spectrum analysis even not showing a trace of the commonly-combined strontia: lime and silica being likewise absent. As regards the latter body, great care in the selection of the sample for analysis is necessary on account of the fine siliceous sand just mentioned as frequently enclosed in the crystals.

Epsomite, Epsom Salt: Sulphate of Magnesia.

Epsomite, Epsom Salt (Sulphate of Magnesia).—Occurs very frequently in the tertiary mesozoic-carbonaceous and silurian rocks near Geelong, Bacchus Marsh, Cape Otway, &c.; also sometimes in quartz-reefs, for instance in the Eaglehawk Reef, near Maldon; the Port Phillip Company's reefs, Clunes, &c. It generally appears in snowlike efflorescences, composed of very minute acicular crystals, in cavities and cracks, and on sheltered surfaces of the beds, having, no doubt, resulted from the evaporation of meteoric waters percolating through the rocks.

Alunite: Alumstone.

Alunite, Alumstone.—Was found by Mr. Aplin in small nodules and mammillary crusts in a basalt quarry near the Magnet Hill, at Gisborne. The fracture of the nodules is flat, chonchoidal, sometimes splintery in the centre and earthy outside, and they show, as regards colour, an irregular alternation of brownish and greyish-white bands. Nearly one-third of the weight of

the mineral is soluble in boiling water, the remainder in sulphuric acid with a slight deposit of silica. It appears, according to several analyses, not to be a fixed chemical compound.

Alum Slate. *Alum Slate.*—The black pyrites-bearing slates which occur perhaps on all goldfields might easily be utilised for the production of alum. In the gorge of the Werribee River, near Bacchus Marsh, the faces of the cliffs, hollows, and cracks show frequently efflorescences consisting of a mixture of alum with epsomite and common salt.

Apatite: Phosphate of Lime. *Apatite (Phosphate of Lime).*—Occurs, according to report, at Dunolly in light-greenish grains embedded in quartz. An impure variety of phosphate of lime is sometimes met with in small nodular concretions in the guano deposits of several small islands in Bass' Straits.

Salt: Chloride of Sodium. *Salt (Chloride of Sodium).*—Occurs in considerable quantities as crusts up to two inches in thickness in the beds of the saline lakes and lagoons of the western part of the colony, being the result of slow evaporation of the water during the hot summer months. The following are results of analyses by Mr. C. Newbery of samples of concentrated water from four lakes:—

I.	St. Mary's lake (large lake)	contains	½-lb.	of salt	per gallon	of water.
II.	St. Mary's lake, Woolshed.....................	,,	1 ,, 2 ozs	,,	,,	,,
III.	Lake at Bald Hills, Wynn Wynn..........	,,	1 ,, 7 ,,	,,	,,	,,
IV.	Lake at the edge of heath, Mt. Elgin-road	,,	1 ,, 3 ,,	,,	,,	,,

which gave as closely agreeing results of analyses :

	I.	II.	III.	IV.
Chloride of sodium	91·89	91·63	92·14	91·74
,, ,, potassium	trace	0·21	trace	trace
,, ,, magnesium	2·14	2·40	2·12	2·36
Sulphate of magnesia	4·98	4·86	4·87	4·91
,, ,, lime	0·72	0·81	0·76	0.75
Organic matter......................	0·16	—	0·10	0·23
	99·89	99·91	99·99	99·99

In II. the organic matter is absent, which probably accounts for the sulphuretted hydrogen and the carbonic acid found in the water, as results of decomposition.

At Parupa and Williamschase very fine salt is manufactured, which is nearly of the same composition as Liverpool salt, containing in the mean 98·5 per cent. of chloride of sodium, with traces of chlorides of potassium and magnesium and sulphate of lime.

CARBONACEOUS MINERALS.

Graphite: Plumbago.

Graphite, Plumbago.—Is said to occur at Mount Blackwood, but specimens have not been shown, as yet, to corroborate the statement.

A slaty or shaly substance, more or less impregnated with carbonaceous matter, occurs in many of the reefs of the St. Arnaud and Pleasant Creek districts, both as irregular lumps enclosed in the quartz, and as "casings." Specimens from the latter district vary considerably, from ordinary slaty veinstone to a black sectile substance, presenting much the appearance of true "graphite." Some of the latter, carefully analysed by Mr. C. Wood, gave the following results :—

Slaty matter (silicate of alumina)	71·00
Carbon	17·75
Metallic Iron	8·14
Oxygen, moisture, and loss	3·11
	100·00

If we assume that the whole of the iron is in combination with carbon, the graphitic compound imparting the black colour and metallic lustre to the mineral will have the following percentic composition :—

Carbon	68·6	which corresponds to the chemical formula, C. 10 Fe.
Iron	31·4	

In the Golden Point Gutter, Ballarat, a small scaly, hard, and gritty substance is met with, which is, according to analysis by Mr. C. Wood, true *graphite*, though of inferior quality; marking paper and deflagrating with nitre and chlorate of potash when heated.

Mineral Coal.

Mineral Coal.—Coal-seams exist at Traralgon, Gippsland, Cape Patterson, Griffith's Point, Coal Creek, Bass' River, and other places in the coal rocks along the coast of Western Port, also in the Barrabool Hills, near Geelong, in the Cape Otway ranges, and at Coleraine in the Portland district. Most of the seams vary between a few inches and one foot in thickness; only a few exist at Cape Patterson and Griffith's Point of a thickness exceeding three feet. These are, however, as far as mining exploration has proved, not of any great workable extent. The coal from some of the seams is of very good average quality, that from Griffith's Point and Cape Patterson resembling mostly "pitch" or "caking coal." Some seams, Traralgon, yield a mineral, both in chemical composition and outward character, hardly distinguishable from "Virginian bituminous coal," as proved by the following results of an analysis by Mr. C. Newbery :—

	Traralgon coal.	Virginian bituminous coal.
Moisture	1·85	1·64
Volatile matter	35·98	36·63
Fixed carbon	53·45	50·99
Ash (white)	8·72	10·74
	100·00	100·00

The Traralgon coal is, like the Virginian, bright black, rather hard, with small conchoidal fracture, burns readily, with bright yellow flame, and yields a good firm coke.

Of Cape Patterson coal we have the following two analyses by the late Mr. Chas. Wood :—

	Rock Vein. Mineral, brilliant black, hard, contains pyrites.	Queen Vein. A softer variety than the former, and contains less pyrites.
Hygroscopic water	2·43	4·0
Volatile matter	36·33	28·8
Fixed carbon	54·37	56·4
Ash	6·86	10·8
	99·99	100·0

Both varieties prove very good gas-coals.

The working of the Cape Patterson coal-seams has for several years been repeatedly attempted, but with only poor success hitherto. Although the mineral is of quite as good quality as that of Newcastle, New South Wales, still it cannot compete with the latter in cheapness, a circumstance mainly due to the absence of good roads or tramways for easy access from the mines to the seaboard, combined with the want of good harbour accommodation to ship the coal for the Melbourne market.

Coal Shales (Bituminous Shales).—Are found associated with, generally covering, the coal seams, but occur also separately in the localities just mentioned. They consist of black or brown slaty and shaly beds, full of carbonaceous and bituminous matter : Most of these shales burn, though somewhat sluggishly, under the influence of a good draught. From specimens of such shale from Traralgon and Cape Patterson, Mr. C. Newbery obtained by analysis the following results :— Coal Shales. Bituminous Shales.

	I.		II.	III.	IV.
Carbon	66·74	Hygroscopic Water	—	3.38	5.57
Hydrogen	4·83	Volatile Matter	35.74	22·80	4·17
Oxygen and Nitrogen	5·20	Fixed Carbon	42·68	36·13	1·99
Sulphur	1·65	Ash	21·58	37·69	88·00
Ash	21·58				
	100·00		100·00	100·00	99·73

I. Dried specimen of Traralgon shale.

II. Raw specimen of Traralgon shale, of a dull black colour, with small specs of bright coal disseminated through it ; fracture slaty, indistinct fossil marks, contains about 4 per cent. of hygroscopic water.

III. Cape Patterson shale ; has a dull black colour, conchoidal fracture, burns with a yellow flame, and forms a good coke.

IV. Cape Patterson shale ; brown colour, slaty fracture, does not burn readily.

Brown Coal (Lignite).—Occurs in extensive deposits in the miocene tertiary formation of Lal-lal, and in the pliocene of Cape Otway, also as thin layers in the deep leads of Ballarat (White Horse and Frenchman's leads), Daylesford, Morrison's Diggings, Daisy Hill, &c., and extensively in several parts of Gippsland. The deposit at Lal Lal is near 120 feet in thickness, perhaps unparalleled in any part of the world. It consists of an irregular mixture of brown or brownish-black, earthy, bituminous coal—real "brown coal," with "lignite"—*i.e.*, portions composed of branches, trunks, and stumps of trees, "Conifers," which still exhibit a nearly perfect woody structure, and are so tough as mostly to necessitate the employment of saw and axe for their removal. Occasionally thin, rather shattered seams of "jet" are met with, also narrow lenticular patches and small roundish pieces of two kinds of "resin." Only a few narrow clay-seams intersect this enormous mass of lignite; and iron pyrites (which generally is very abundant in these kinds of deposits, and detrimental to the quality of the lignite as a fuel), is, so far as examination goes, very sparingly distri- Brown Coal Lignite. Jet.

buted through it. All attempts to bring this lignite into use as fuel, especially for steam-engines in the neighbouring mining district of Ballarat, have hitherto failed, principally on account of its burning away too quickly. A patented process by which the pulverized lignite is mixed with coal-tar, and compressed into the form of bricks, has apparently not succeeded, as the company connected with the patent has collapsed. Some recent experiments to compress the finely-ground lignite *per se* by means of an hydraulic press, have, however, proved successful, and there is in consequence good hope that, by use of the compression-machinery, advantageously used for brown-coal in Germany, the Lal Lal deposit may soon be utilised, and in some measure atone for the apparent scarcity of workable coal-seams in Victoria. The following are results of experiments and analyses of Lal Lal and Gippsland lignite by Mr. Chas. Wood and Mr. Cosmo Newbery :—

	I.	II.	III.	IV.	V.	VI.		VII.
Fixed carbon	29 3	27·9	26·7	38·5	39·0	35·17	Carbon ...	66·1
Volatile matter	20·7	22·1	23·3	20·0	20·4	41·25	Hydrogen	5·11
Hygroscopic water ...	48·7	48·7	48·7	40·[illegible]	40·0	17·73	Oxygen...	18·4
Ash	1·3	1·3	1·3	0·5	0·6	5·85	Nitrogen.	0·56
							Sulphur.	2·72
							Ash	7.11
	100·0	100·0	100·0	100·0	100·0	100·00		100·00

I., II. AND III. Analyses by Mr. Charles Wood of brownish-black, earthy-brown coal from Lal Lal. Gives per ton about 5500 cubic feet of inflammable gas, which being however largely contaminated with carbonic acid and carbonic oxide, and probably atmospheric air, burns with but little luminosity. The latter part of the aqueous distillate was of a fine carmine colour, which was discharged by acids and reproduced by alkalies. This is due to an organic basic body not yet determined. The colour is very unstable and of no use in the arts.

III. AND IV. Analysis by Mr. Charles Wood of the woody variety of lignite from Lal Lal. The sample retained, after drying, its original woody structure, and even its brightness to a certain extent; it is very sectile, and when cut presents a compact smooth surface, exhibiting the marking of wood. When heated with a solution of potassa, it is partially dissolved, giving a dark brown liquid; with strong nitric acid it is entirely dissolved, giving rise to the evolution of copious nitrous fumes.

VI. AND VII. Analysis by Mr. C. Newbery of lignite from a seam 55 feet thick, on Cross-Over Creek, Gippsland. This lignite has a dull black colour, conchoidal fracture, is brittle, and burns only at a high temperature, with a yellow flame; it forms no coke.

VI. is the analysis of the raw lignite.

VII. is the analysis of the lignite dried.

Bitumen Mineral Pitch.

Bitumen (Mineral Pitch).—Specimens of this mineral, generally of the asphaltum kind, have frequently been brought from the Western Port and Portland districts, but it has as yet not been discovered in sufficient quantities to be of commercial importance. A peculiar kind of bitumen, somewhat sticky to the touch, and greatly mixed with the excrement of opossums and other native animals, beetles' wings, chips of wood, &c., occurs in the Grampians and Pyrenees, in small caverns or on ledges of rock. Mr. C. Newbery examined this substance, with the following results :—"It burns, when heated in a crucible, with a yellow flame and disagreeable bituminous odour, leaving a large amount of grey ash, which consists of alumina, lime, magnesia, potassa, soda, and carbonic—sulphuric—and phosphoric acids. Being a nitrogenous body, it is probably the result of a peculiar decomposition of the excrement and other animal matter."

Mineral Resins

Mineral Resins.—Two kinds of resin occur in narrow lenticular patches and small roundish pieces in the Lal Lal lignite deposit; one semi-transparent, of a honey-yellow or reddish-brown colour, and very brittle, resembles *Middletonite*: the other is greyish-white, opaque, earthy, and

somewhat flexible and elastic when fresh from the mine, but becomes hard and brittle afterwards; it most nearly resembles *Retinite* from the Bovey coal. Both these resins burn easily, and, emitting with much smoke fine fragrant odours, leave shining carbonaceous residues.

Another mineral resin occurring at Cape Patterson was examined by Mr. C. Newbery, with the following results:—"It has an amber colour, conchoidal fracture, burns readily in flame, with aromatic odour and much smoke, is soluble in benzole, spirits of turpentine, olive oil, and sulphuric acid, and insoluble in nitric acid, alcohol, and the alkalies."*

MINERAL SPRINGS.

Victoria appears, as far as exploration shows, to be singularly poor in mineral springs, and those which are known, present very little variety as regards chemical or medicinal properties. In fact, only two species occur—namely, the "acidulo-alkaline" and the "saline" (briny) ones. Thermal waters appear to be wholly absent. This deficiency is the more remarkable, if we consider the great amount of disturbance the country must have undergone during the enormous outbursts of volcanic matter (basaltic lava) in tertiary periods—phenomena which in other parts of the world are intimately connected with, and apparently the cause of the occurrence of mineral springs in abundance, and of great variety in chemical and physical properties. As our knowledge of the minor features of many parts of Victoria is still very limited, it is certainly not impossible that more mineral springs may be found in course of time, though it is to be feared that few, either really valuable, or thermal waters, are likely to exist, as traces of such would otherwise no doubt have already been discovered.

The springs known up to the present time, which belong to the acidulo-alkaline class are four in number, viz.:—One near Hepburn; one on the banks of the Merri Creek, about thirty miles from Melbourne; one about six miles north of Ballan, on the Daylesford road; and one about four miles south of Glenlyon, on the east bank of the Loddon river.

All mineral waters of this kind, of which the "seltzer water" is the best known and most valuable representative, are generally held in high esteem. They contain a considerable amount of carbonic acid, both as free gas and in chemical combination (bi-carbonates), which imparts to them an agreeably acidulous taste, and a brisk and sparkling appearance, and causes them to effervesce strongly on being mixed with wine. If not preserved in closely-corked bottles, all the free carbonic acid gas easily escapes, and also a certain amount of that in chemical combination; this renders the water turbid, and a yellowish deposit is gradually formed, consisting chiefly of carbonate of lime, mixed with hydrous sesquioxide of iron. This reaction will also occur, even through repeated opening of the bottles. At the springs themselves a similar deposit is formed round the margins, and in the watercourses.

Of the four springs mentioned, that of Hepburn, which rises in a brownish silurian sandstone, is the most important, and its water has been best examined. Besides a qualitative analysis made in the laboratory of

* A peculiar kind of gum, resembling in its properties, to a certain degree, both "*Elaterite*" and "*Caoutchouc*," occurs in shallow pans in the sand on the coast at the Coorong, south of the mouth of the Murray river. It is most likely the result of a peculiar decomposition of vegetable matter, probably chiefly sea-weed.

the Geological Survey, the late Dr. Maund, Government analytical chemist, gives in "Transactions of the Victorian Philosophical Institute, 1851," its quantitative analysis as follows :—

	Per lb. grains.	Per gallon grains.
Carbonate of lime	4·747	47·470
„ magnesia	2·570	25·700
„ soda	4·380	43·800
„ iron	0·100	1·000
Chloride of sodium	0·640	6·400
Sulphate of soda	0·223	2·230
Phosphate of alumina	trace	trace
„ lime	0·030	0·300
„ iron	0·182	1·820
Alumina	0·100	1·000
Silica	0·330	3·300
Organic matter	0·097	0·970
	13·399	133·99

The quantity of free carbonic acid gas is not definitely ascertained as yet, but it may, according to Dr. Maund's experiments, be about 100 cubic inches of gas in 100 cubic inches of water. As regards the medicinal properties of this water, Dr. Maund says further—"The medicinal effects of the Hepburn water (and waters of a similar kind) are not of a slight character. The excess of carbonic acid makes them refreshing and exhilarating, and useful in allaying nausea and irritation of the stomach, while the salts they contain act directly on the renal and digestive organs, rendering the waters extremely beneficial in hepatic, gouty, rheumatic, and other affections."

The reddish-brown, sludgy deposit round the margin and in the watercourse of this spring consists, according to a qualitative analysis made in the Geological Survey laboratory, of :—

Carbonate of lime and magnesia.
Sulphate of lime.
Hydrous sesquioxide of iron.
Alumina.
Phosphoric acid } strong traces.
Silicic acid }
Insoluble substances : clayey matter and quartz sand.

"Saline,"—commonly so called "brackish," water springs exist in many parts of the colony, but are not copious enough to render them of any general value, nor do they possess special medicinal properties. Their taste is mostly very disagreeable, and they consist, according to analyses by Dr. Maund and Mr. C. Newbery, chiefly of chlorides of sodium, magnesium, and calcium, with sulphates of soda, magnesia, and lime, and occasionally iron, alumina, and traces of potash.

ARTIFICIAL GOLD-AMALGAM CRYSTALS.*

The formation of crystals of gold amalgam in the mercury troughs below the blanket tables at the Port Phillip Company's works at Clunes, is interesting in a scientific as well as in a practical point of view.

No occurrence of this kind has been recorded in any work on metallurgy. Natural gold amalgam in small white grains, easily crumbling, has been found in the platinum region of Columbia, the composition being :

Mercury, 57·40 ; Gold, 38·39 ; Silver, 5·0.

There have been silver-amalgam crystals produced at the smelting works of Joachimsthal in Saxony ; and according to Mr. Rosales, Wherle says

* Remarks referred to in foot-note, page 45.

in his "Metallurgy" that if the quicksilver of gold amalgam is very slowly evaporated, the gold will appear crystalline and in small crystals at the surface; but neither of these cases can compare in interest with the formation of the gold-amalgam crystals at Clunes, which seem to have formed at the bottom of the mercury troughs in the same way, as any salt shoots out in crystals from its saturated solution in water. The formation of the Clunes crystals can only be viewed in this light. The extremely fine gold escaping from the blankets must have been dissolved in the Quicksilver as it would be in aqua regia. In course of time the quicksilver became thus more and more charged or saturated with gold, till a point, the limit of saturation, was reached, when probably, favoured by the constant steady influx of the water and the vibration of the trough, caused by the concussion of the stamps, the process of crystallization commenced, and proceeded slower or quicker in proportion to the rate at which the gold was supplied from the blankets. Had the troughs remained eighteen, instead of nine months undisturbed, the crystals, which now, with few exceptions, are very small, might have become much larger. With regard to the chemical composition of the crystals, they appear to contain only a small percentage of quicksilver, with a relative fixed proportion of gold, and are in fact an ore or mineral; in this respect probably the analogue of the rich silver amalgam, the *Arquerite*, from the mines of Arqueros, near Coquimbo, which contains 86·5 Ag., and only 13·5 Hg., whilst the native gold amalgam from Columbia seems, by its large percentage of quicksilver, 57·40, more analogous to the common silver amalgam of Almaden, Idria, &c., which also contains 60·0—73 of quicksilver. That the quicksilver only forms a small percentage in the composition of the Clunes crystals, is probable from their hardness, which is about 3·5, whilst the Columbian ore is 1, and further, from the fact that, when treating the crystals in nitric acid, as done by Mr. Latta, assayer at Clunes, they do not become loose and spongy as would have happened, if the quicksilver had been present in any large proportion, but they preserve all the appearance and lustre of solid gold crystals; a peculiar concavity of the crystal planes, and innumerable small hollows and cracks (the latter distinct from the striations of crystallization), visible only under the microscope, prove, however, the removal of the quicksilver.

On close examination of several very small crystals, the octahedron appears prominent, the corners or solid angles always truncated by the cube, and the edges by the dodecahedron. On some crystals, however, distinct hemihedral planes of the trapezohedron occur (Hemi-trisoctahedron), and also, though more obscure, those of the trisoctahedron. The recognising and proper holding of the crystals is generally difficult, as they are more or less distorted, mostly pressed flat in the direction of one axis. Crystals resembling rhombic prisms, with terminal planes, similar to heavy spar, are very frequent.

Another form of gold-amalgam in bunches of microscopic acicular crystals (apparently six-sided prisms, with oblique terminal planes resembling hornblende) are produced if fine gold is slowly dissolved in mercury and pressed through chamois leather. If this amalgam is treated with nitric acid, the crystals remain, exhibiting a fine gold lustre, which is little liable to tarnish by the atmosphere.

GEORGE H. F. ULRICH.

GLOSSARY.

For the use of persons who may wish to obtain some knowledge of the outlines of the geology of Victoria, and are not acquainted with the technical terms necessarily used in these notes, or are otherwise unable to look them out in any of the numerous published manuals and text-books on the subject, I have appended a glossary of such terms, and also a tabular sketch of the arrangement of British stratified rocks, showing the order of succession of the several systems, groups, and periods, and their probable representatives in the Victorian series.

For further elementary and general information, I would recommend the perusal of *Jukes's School Manual*, or *Page's Advanced Text Book*, in which the fullest information will be found respecting all technical terms used in geology, and in which the methods of observation and reasoning, the practical and theoretical bearings of the science, and its aims and objects generally, are fully explained.

ALFRED R. C. SELWYN.

AGATE (said to be from the River Achates, where fine varieties occur).—A mixed siliceous mineral found in veins, nodules, and geodes. The geodes often consist of alternating bands, or deposits of carnelian, calcedony, jasper, opal, quartz, &c.; hence the varieties of the mineral are known by such names as ribbon-agate, fortification-agate, brecciated-agate, moss-agate, &c.

ALBITE (Lat. *alba*, white).—A variety of felspar of a greyish-white or milky-white colour, composed of silex 70·5, alumina 19·5, soda 9·5, and traces of lime and oxide of manganese. It is also known as *Cleavlandite*.

ALLUVIUM (Lat. *luere*, to wash, and *ad*, together).—Matter washed or brought together by the ordinary operations of water is said to be *alluvial*, and the soil or land so formed is spoken of as *alluvium*. The soil of most of our river-plains, which have been the sites either of lakes or of estuaries, are alluvial. Our straths, carses, dales, holms, and meadow-lands are chiefly alluvial. *See* Diluvium.

ALUM (Lat. *alumen*, Gr. *'als*, *'alos*, salt).—Alum is a double salt, the sulphate of alumina and potash, the crystals of which contain nearly 50 per cent of water. Alum is chiefly manufactured from certain shales, as those of the Lias in Yorkshire, of the coal in Lanarkshire, &c.; hence *alum-shale*, *aluminite*, *alum-stone*, &c.

ALUMINA.—The pure plastic principle of clay, which is usually a silicate of alumina. Alumina is, in fact, an oxide of the metal aluminum, consisting of aluminum 12, and oxygen 8.

AMYGDALOID (Gr. *amygdalon*, an almond, and *eidos*, form).—This term is applied to certain igneous rocks containing small almond-shaped vesicular cavities, either partially or entirely filled with agate, jasper, calc-spar, and other minerals. These minerals being of a different colour from the mass of the rock in which they are imbedded, look like almonds in a cake; hence the term *amygdaloidal*.

ANALCIME (Gr. *a*, without, and *alkimos*, strong).—A zeolitic mineral, found abundantly in trappean rocks, so called from its feebly-electric properties. Same as Cubizite.

ANTHRACITE (Gr. *anthrax*, carbon).—A variety of coal almost wholly deprived of its bitumen. It may be regarded as natural coke or charcoal, formed by subterranean or chemical heat. Ordinary bituminiferous coal is often found converted into a kind of coke by the contact of igneous rocks; and in this way many anthracites may have originated.

ANTICLINAL (Gr. *anti*, on opposite sides, and *clino*, I bend).—Applied to strata which dip in opposite directions from a common ridge or axis—like the roof of a house—and form what is termed an "anticline" or "saddle-back."

ARENACEOUS (Lat. *arena*, sand).—Rocks composed of grains like sand, or containing sand in any notable degree, are said to be *arenaceous*.

ARGILLACEOUS (Lat. *argilla*, clay).—Applied to all rocks or substances composed of clay, or having a notable proportion of clay in their composition. Argillaceous rocks are readily distinguished by the peculiar odour they emit when breathed on.

AUGITE (Gr. *augé*, lustre).—A mineral entering largely into the composition of many trap and volcanic rocks. In composition it is closely allied to hornblende, but differs in the form of crystal—is less siliceous, and of greater specific gravity. Known also as *Pyroxene*.

AXIS (Lat. *axis*, a pole or axle-tree).—A word used largely and variously in natural science: applied to the line about which objects are symmetrical, along which they are bent, around which they turn, or to which they have some common relation; hence "vertebral axis," "axis of elevation," "synclinal axis," &c.

AZOIC (Gr. *a*, without, and *zoe*, life).—Applied to the lowest strata, which have yet yielded no traces of life. Used by many as synonymous with Hypozoic, Non-fossiliferous, and Metamorphic, which see.

BASALT (Gr. and Lat. *basaltes*, but of unknown origin, some deriving it from an Ethiopian word, *basal*, iron, and others from *als*, salt, in allusion to its crystallised or columnar structure).—An abundant member of the trappean group, close-grained, hard, usually black, and

frequently columnar; the columns regular and jointed.

BASIN.—Any concave surface of strata dipping towards a common axis or centre is termed a *basin*, *trough*, or *syncline*. The tertiary rocks often occupy limited areas, and dip in this way; hence "London basin," "Paris basin," &c.

BITUMEN (Gr. *pitus*, the pitch-tree).—Mineral pitch or tar. As a class, the Bitumens are inflammable mineral substances, which burn like pitch, with much smoke and flame. Naphtha, petroleum, and asphalt are familiar examples; and substances impregnated with them, or which yield them on distillation, are said to be *bituminous*, though *bituminiferous* would be the more appropriate term.

BITUMINOUS (see Bitumen).—Containing bitumen, or having the properties of bitumen; *bituminiferous*, yielding bitumen naturally or by distillation; *bituminated*, impregnated or prepared with bitumen; *bituminise*, to prepare or coat with bitumen; and *bituminisation*, the natural process of being converted into bituminous matter.

BOULDERS.—Any rounded or water-worn blocks of stone, which would not from their size be regarded as pebbles or gravel, are termed *boulders*. The name, however, is generally restricted to the large water-worn and smoothed blocks found imbedded in the clays and gravels of the "Drift formation."

BRECCIA.—(Ital., a crumb or fragment).—A term applied to any rock composed of an agglutination of angular fragments, as "volcanic breccia," "osseous breccia," &c. A *breccia* or *brecciated rock* differs from a conglomerate in having its component fragments irregular and angular, whereas the pebbles of the latter are rounded and water-worn.

BROWN-COAL.—Another name for tertiary lignite, in allusion to its colour, as distinguished from the clear shining black of true coal.

CALCAREOUS (Lat. *calx*, *calcis*, lime).—Composed of, or containing a considerable portion of lime.

CAINOZOIC (Gr. *kainos*, recent, and *zoë*, life).—The upper stratified systems holding recent forms of life, as distinguished from *mesozoic* and *palæozoic*.

CAMBRIAN and CUMBRIAN.—Terms applied by Professor Sedgwick to the strata which lie beneath the true silurian system, from their occurring largely in Wales (Cambria) and in Cumberland.

CARBONACEOUS (Lat. *carbo*, coal).—Coaly: applied to rocks containing abundant traces of fossil, carbon, or vegetable debris; hence carbonaceous shales, sandstones, &c.

CARBONIFEROUS (Lat. *carbo*, coal, and *fero*, I yield).—Coal-yielding or coal-bearing. The term is usually applied to that system of strata from which our chief supplies of coal are obtained.

CLAYSTONE and CLAYSTONE-PORPHYRY.—Felspathic igneous rocks of a tough but earthy texture.

CLAYSTONE.—Compact felspar.

CLEAVAGE.—A fissile structure not coincident with (often at right angles to) the original lamination or bedding of the strata in which it occurs. Prevalent in clay-slates: hence their peculiar fissility.

CONCRETIONARY (Lat. *con*, and *cretus*, grown together).—Nodules like those of chert or ironstone, the grains and spherules of oolite, and the grape-like clusters of the magnesian limestone, are termed concretions, as formed by a molecular aggregation distinct from *crystallisation*.

CONGLOMERATE (Lat. *con*, together, and *glomerare*, to gather in round heaps).—Rocks composed of consolidated gravels; known also as *pudding-stones*, from the resemblance of the pebbles in the mass to the fruit in a plum-pudding.

CRATER (Gr. *krater*, a cup or bowl).—The mouth or orifice of a volcano; so called from its cup or bowl-like shape. The craters of volcanoes have in general one side a little lower, owing to the prevailing winds carrying the greater portion of the light material (scoriæ and ashes) to the opposite side.

CROP.—The edge of any inclined stratum when it comes to the surface is called the *crop* or *out-crop*.

CRYSTAL (Gr. *krystallos*, ice).—Originally applied to transparent gems, but now extended to all minerals having regular geometrical forms. *Crystallised*, having the structure of a crystal; *crystalline*, confusedly crystallised; and *sub-crystalline*, indistinctly or faintly crystalline.

DENUDATION (Lat. *de*, down, and *nudus*, naked).—Laying bare by removal. The removal of superficial matter, so as to lay bare the inferior strata, is an act of denudation; so also the removal by water of any formation or part of a formation.

DEPOSIT (Lat. *de*, down, and *positus*, placed).—Applied to matter which has settled down from suspension in water. Mud, sand, &c., are deposits, and are usually distinguished by the positions in which they occur, as fluviatile, lacustrine, marine, &c.

DETRITUS (Lat. *de*, down, and *tritus*, rubbed or worn).—An appropriate term for accumulations arising from the waste of exposed rock-surfaces.

DEVONIAN.—A synonym of the Old Red Sandstone which is typically developed in Devonshire.

DIP.—The inclination or angle at which strata dip from the plane of the horizon, or level.

DOLERITE (Gr. *doleros*, deceptive).—A variety of greenstone, composed of felspar and augite; so called from the difficulty of discriminating these compounds.

DYKE (Scot. a wall or fence).—Applied to those wall-like intrusions of igneous rock which fill up veins and fissures in the stratified systems. In general, they burst through and displace the strata, though occasionally they merely fill up rents and fissures.

DYNAMICS—GEOLOGICAL.—These include the nature and mode of operation of all kinds of physical agents that have at any time and in any manner affected the surface and interior of the earth.

EFFLORESCENCE (Lat. *effloresco*, I put fort flowers).—Applied in mineralogy to those saline excrescences which cover certain minerals, like alum shale, sulphuret of iron, &c., when exposed to the action of the atmosphere.

ELVAN, ELVAN COURSES.—A Cornish name for a felspathic rock, occurring in dykes, in the mining districts.

EOCENE (Gr. *eos*, dawn, and *kainos*, recent).—Sir C. Lyell's term for the lowest group of the tertiary system in which the dawn of recent life appears. The percentage of recent shells in the group is from 3 to 6; in the Miocene from 18 to 24; and in the Pliocene from 35 to 60.

EPOCH.—The point of time when any event happened.

ERA—PERIOD.—The measure of time which has elapsed between two events; duration.

ESTUARY DEPOSITS.—Such as are often istinguishable from truly marine and truly fresh water strata.

ESCARPMENT (Fr. *escarper*, to cut steep).—The abrupt face or cliff of a ridge or hill-range.

ESTUARY (Lat. *æstus—æstuo*, to boil—the tide; so called from the troubled boiling up of the water-line which marks its approach).—Estuaries are, properly speaking, tidal river-mouths, like those of the Thames, Severn, Solway, &c., whose fauna and flora are mixed fresh-water and marine.

FALSE BEDDING.—Oblique stratification.

FAULT.—The term for any fissure accompanied by a displacement of the strata on either side. On one side the strata may be thrown down many fathoms, on the other thrown up; and at the same time may be altered in their dip or inclination.

FAUNA (rural deities).—A convenient term for the animals of any given epoch or area.

FELSPAR (Ger. rock-spar).—A siliceous mineral, combined with soda or potash, and variously coloured, which enters largely into the composition of all igneous rocks—granite, porphyry, greenstone, and trachyte.

FELSPATHIC.—Composed of, or abounding in felspar; applied to certain traps, porphyries, claystones, &c.

FERRUGINOUS (Lat. *ferrum*, iron).—Impregnated with oxide of iron; *ferriferous*, yielding iron.

FLORA (the goddess of flowers).—A convenient term for the vegetation of any given epoch or area.

FLUVIATILE (Lat. *fluvius*, a river).—Belonging to a river, or produced by river action.

FORMATION.—This term is often loosely used by geologists, but should be restricted to any assemblage of rocks connected by geological position, by immediate succession in point of time, and by organic and mineral affinities.

FOSSIL (Lat. *fossus*, dug up).—Technically applied in geology to all petrified remains of plants and animals found in the earth's crust. When only partially petrified, or recent, the term *sub-fossil* is employed.

FOSSILIFEROUS.—Applied to strata containing organic remains.

FREESTONE.—Any rock which admits of being freely cut and dressed by the builder; generally applied in Scotland to sandstone.

GEOLOGY (Gr. *gê*, the earth, and *logos*, doctrine).—Embraces all that can be known of the constitution and history of our planet.

GLACIER (Lat. *glacies*, ice).—Applied to those masses of ice, or of snow and ice, which collect in the valleys and ravines of snowy mountains like the Alps, and which move downward with a peculiar motion, smoothing the rocks over which they pass, and leaving mounds of debris (*moraines*) as they melt away.

GNEISS.—A German miner's term for the granitoid schists of the oldest or primary strata.

GRANITE.—Literally grain-stone; an aggregate of felspar, quartz, and mica. *Granitic*, belonging to the granite series; *granitoid*, having the aspect of granite.

GRAPTOLITES (Gr. *grapho*, I write, and *lithos*, stone).—Characteristic silurian zoophytes akin to the virgularia or sea-pen of modern seas; hence the name.

GREENSTONE.—A prevalent igneous rock composed of felspar and hornblende.

GRIT.—Any hard sandstone in which the grains of quartz are less rounded or "sharper" than in ordinary sandstones are technically termed *grits*—as millstone-grit, grindstone grit.

HÆMATITE (Gr. *haima*, blood).—Red oxide of iron; an abundant ore found in veins and masses.

HORNBLENDE.—A simple mineral of frequent occurrence in granitic and trappean rocks; so called from its horn-like cleavage and peculiar lustre (*blenden*, to dazzle). It is usually of a black or dark-green colour, softer than quartz or felspar, but heavier than either, and emits a peculiar bitter odour when breathed on. It generally occurs confusedly crystalline, forming with quartz "hornblende rock," with quartz and felspar "syenite," and with felspar alone the numerous varieties of "greenstone."

HORNSTONE.—A mixed siliceous mineral and rock of various colours, having a dull splintery or sub-conchoidal fracture, and very much the aspect of a tough massive flint. It is sometimes difficult to distinguish between jasper, flint, chert, and hornstone, though the latter term is more appropriately applied to all compact, tough, and massive varieties of siliceous rock. It consists chiefly of silex and alumina, and differs from the felspars in containing no soda or potash. A common igneous rock, consisting of hornstone, with imbedded crystals of quartz or felspar, is known as *hornstone porphyry*.

HYPOGENE (Gr. *hypo*, under, and *ginomai*, I am formed).—A term employed by Sir Charles Lyell as a substitute for *primary*, merely to mark the formation or transformation of these strata from below, without involving any theory as to their age.

HYPOZOIC (Gr. *hypo*, under, and *zoe*, life).—Applied to those rocks which, like gneiss and mica-schist, lie beneath the fossiliferous strata, and which have yet yielded no organic remains. "Azoic" means destitute of fossils; "hypozoic" simply points out their position, without offering any opinion as to their fossiliferous or non-fossiliferous character.

IGNEOUS (Lat. *ignis*, fire).—Applied to all agencies, operations, or results which seem connected with or to have arisen from subterranean heat, as "igneous rocks," "igneous fusion," &c.

LABRADORITE.—Called also Labrador felspar, from the locality where first found: a variety of disseminated felspar, having a peculiar pearly and iridescent play of colours when the light falls on it in certain directions.

LACUSTRINE (Lat. *lacus*, a lake).—Of or belonging to a lake, as lacustrine deposits.

LAVA.—The general term for all rock matter which flows in a melted state from volcanoes.

LEPIDODENDRON.—A genus of fossil plants. (scale and tree, Gr.)

LIGNITE (Lat. *lignum*, wood).—Wood-coal, or fossil-wood, converted into a kind of coal. *See* Brown-Coal.

MAMMILLARY (Lat. *mamilla*, little pap).—Applied to surfaces covered with pap-like concretions, as some magnesian limestones. *See* Botryoidal.

MARBLE.—Any rock susceptible of a fine polish is termed "marble" by the stone-cutters. The term, however, should be restricted to limestones.

MARL (Sax.)—Any soft admixture of clay and lime is termed marl; "clay-marl" when the clay predominates; "marl-clay" when the lime is most abundant; and "shell-marl" when it contains fresh-water shells, as the lymnea, paludina, &c.

MEIOCENE (*meion*, less, and *kainos*, recent).—Sir Charles Lyell's term for the middle tertiaries, as holding a less percentage of recent species than the pliocene. *See* Eocene.

MESOZOIC (Gr. *mesos*, middle, and *zoe*, life).—The great division of stratified groups holding the middle forms of life as differing from the Palæozoic and Cainozoic.

METAMORPHISM (Gr. *meta*, change, and *morphê*, form), literally transformation.—That change of structure or of texture which has been effected on many rocks by the agency of heat, chemical action, or otherwise.

MICA (Lat. *mico*, I shine).—A mineral well

known from its metallic lustre and divisibility into thin shining flakes. It occurs crystallised in granite, the disintegration of which has supplied it to the subsequently-formed sedimentary rocks.

MICA-SCHIST (also called, but improperly, "mica-slate").—A metamorphic foliated rock composed of mica and quartz.

NODULE.—Any irregular concretion of rock-matter collected by attraction or aggregation round some central nucleus, as nodules of ironstone, flint, &c.

OBSIDIAN (Gr. *opsianus*, from being used for looking-glasses).—A volcanic glassy lava, almost indistinguishable from artificial glass-slag. It consists of silica and alumina, with a little potash and oxide of iron, and is a true volcanic glass, of various colours, but usually black and nearly opaque.

OLIGOCLASE (Gr. *oligos*, small, and *klasis*, fracture).—A mineralogical term for soda felspar, in allusion to its peculiar fracture as distinguished from orthoclase.

OLIVINE.—An olive-coloured semi-transparent mineral, occurring in rounded grains and crystals in many basalts and lavas.

OOLITE (Gr. *oon*, egg, and *lithos*, stone).—Limestone composed of small rounded particles like the eggs or roe of a fish; hence also called *roestone*. The name of an important stratified system, in which limestones of this nature are characteristic beds.

ORTHOCLASE (Gr. *orthos*, straight, and *klasis*, fracture).—A mineralogical term for potash felspar, because of its straight flat cleavage.

OROGRAPHY.—The structure and origin of mountains.

OUTLIERS.—Portions of any stratified group which lie detached from the main body; in general the result of denudation.

PALÆONTOLOGY (Gr. *palaios*, ancient, *onta*, beings, and *logos*, doctrine).—The science of fossil remains; the botany and zoology of the forms found fossil in the crust of the earth. It has been proposed to subdivide the science into palæo-phytology, or fossil botany, and palæo-zoology, or fossil zoology; but these terms are rarely used. *See* also Oryctology.

PALÆOZOIC (Gr. *palaios*, ancient, and *zoë*, life.)—The lowest division of stratified groups as holding the most ancient forms of life, in contradistinction to the *mesozoic* and *cainozoic*.

PEGMATITE (Gr. *pegma*, compacted, or congealed).—A binary granite composed of quartz and felspar—the felspar crystals lying in the quartz as in a matrix.

PLEIOCENE (Gr. *pleion*, more, and *kainos*, recent).—Sir C. Lyell's term for the upper tertiary group, as containing more of recent than of extinct species. *See* Eocene.

PLEISTOCINE (Gr. *pleistos*, most, and *kainos*, recent).—A term used as synonymous with Post-tertiary, and implying that the organic remains in such accumulations belong almost wholly to existing species.

PLUTONIC (Pluto, the god of the inferior regions).—Igneous rocks formed at some depth below the surface of the land or sea, as distinct from *Volcanic* or those thrown up to to the surface.

PORPHYRY (Gr. *porphyreos*, purple).—This term was originally applied to a reddish igneous rock found in Upper Egypt, and used for sculptural purposes. It is now employed by geologists to denote any rock (whatever its colour) which contains imbedded crystals distinct from the main mass or matrix. We have thus felspar porphyry, claystone porphyry, porphyritic granite, and porphyritic greenstone.

PRIMARY, PRIMITIVE.—Applied by the earlier geologists to non-fossiliferous rocks, such as gneiss and mica-schist, from the belief that they were first-formed (*primus*, first) or deposited before the creation of life on our globe. Equivalent to Hypogene or Azoic.

PUMICE (Ital. *pomice*, akin to, *spuma*, froth).—A light spongy lava; volcanic froth or scum.

PYRITES (Gr. *pyr*, fire, and *ites* for *lithos*).—Sulphurets of iron, copper, &c., are so termed, either from the hardness of iron pyrites, which strikes fire, or from its decomposing spontaneously with a considerable evolution of heat.

QUARTZ.—A German miner's term for crystallised silica; rock-crystal; silica in its purest rock-form.

QUARTZITE.—An aggregation of quartz grains; granular quartz. This term is generally applied to sandstones which have been indurated or altered by heat so as to assume the aspect of quartz rock.

SALINE (*sal*, salt).—Containing or impregnated with salt, as "saline" springs.

SCHIST (Gr. *schisma*, a splitting or division).—This term should be restricted to such rocks as mica-schist, gneiss, and the like, which have a foliated structure, and split up in thin irregular plates, not by regular cleavage as in slate-rocks.

SEAM.—Strictly speaking, the line of separation between two strata, but loosely applied to subordinate strata occurring in any series, as *seams of coal* in the coal-measures.

SECONDARY STRATA.—Originally applied to the fossiliferous strata lying between the Transition and Tertiary. Same as Mesozoic.

SECTION (Lat. *sectus*, cut through).—The plane, actual or ideal, which cuts through any portion of the earth's crust so as to show the internal structure of that portion. *Natural* sections are exhibited by sea-cliffs, sides of ravines, &c.; *artificial* ones by road and railway cuttings, wells, and coal-pits.

SEDIMENT (Lat. *sedere*, to settle down).—Matter settled down from suspension in water. If the turbid muddy waters of a river be allowed to stagnate, the mud will gradually fall to the bottom and form sediment. Rocks which have been formed in this manner, as shale, clay, sandstone, &c., are termed *sedimentary*.

SHALE (Ger. *schalen*, to peel or shell off).—Applied to all argillaceous strata that split up or peel off in thin laminæ. *Clay* is massive or plastic; *marl* is friable or crumbly; *shale* occurs in leaf-like laminæ.

SILICEOUS (Lat. *silex*, flint).—All rocks having a flinty texture are said to be siliceous. Rock-crystals and quartz are the purest states in which *silex* occurs in nature: common flint is an impure variety.

SLATE.—This term should be restricted to argillaceous rocks, like roofing-slate, whose lamination is not produced by lines of bedding, but is due to a metamorphism called *cleavage*, which often runs at right angles to the line of stratification.

STRATUM, plural STRATA (Lat. *stratum*, strewn or spread out).—When rocks lie in layers, one above another, each layer forms a *stratum*, the whole a series of *strata*. Rocks lying in parallel layers are said to be *stratified*; those among which there is no appearance of this arrangement *unstratified*. Layer, bed, seam, band, &c., are less or more used as synonymous with stratum.

STRIKE.—The direction or line of outcrop of any stratum. The strike of a stratum is at right angles to its dip.

SYENITE (from *Syene*, in Upper Egypt).—A

granitic rock composed of felspar, quartz, and hornblende.

SYSTEM (Gr. *syn*, together, and *istemi*, to stand).—Groups of objects or occurrence having such relations as permit them to be classed together, constitute a system.

TABULAR.—Composed of, or arranged in, square blocks or table-like masses, as many granites and greenstones. The tabular frequently passes into the columnar structure, and *vice versa*.

TERTIARY.—The third or upper great division of the stratified systems, as distinguished from secondary and primary.

TRACHYTE (Gr. *trachys*, rough).—A felspathic volcanic rock; so called from its harsh meagre feel.

TRAP.—A provincial term for a tufaceous alluvium which occupies wide areas in the region of the Rhine. Its basis consists almost entirely of pumice, in which are included fragments of basalts and other lavas, pieces of burnt shale, slate, sandstone, and numerous trunks and branches of trees.

TRAP, TRAPPEAN (Swed. *trappa*, a stair).—Tabular greenstone and basaltic rocks, from their rising up in step-like masses, were originally so termed; but the name is now extended to all igneous rocks which are not either strictly granitic or decidedly volcanic. Others derive the origin of the term from the terrace-like aspect of secondary hills, generally composed of interstratified greenstones, basalts, amygdaloids, &c., which stand out in ledges from the softer strata that have yielded to denuding forces.

UNCONFORMABLE.—Strata lying parallel on each other are said to be *conformable;* but when one set is laid on the upturned edges of another, they are *unconformable*.

UNSTRATIFIED.—Used as synonymous with igneous; rocks which do not occur in layers or strata, but in amorphous masses.

VEIN (Lat. *vena*).—Applied in geology to all fissures and rents filled with mineral or metallic matter differing from the rock-mass in which they occur.

VESICULAR (Lat. *vesicula*, a little bladder).—Applied to rocks full of little cavities, as vesicular lava, vesicular traptuff, &c.

VOLCANIC (*Vulcanus*, god of fire).—Igneous action apparent at the surface of the earth, in contradistinction to *Plutonic* (which see), or that taking place at great depths in the interior. *Volcanic*, as applied to rocks, embraces all igneous products of recent or modern origin, as distinct from trappean and granitic.

ZAMITES.—Fossil plants apparently allied to the existing zamia.

COMPARATIVE TABULAR ARRANGEMENT OF STRATIFIED ROCKS.

BRITISH.				VICTORIAN.		
SYSTEMS.	GROUPS.	PERIODS.				
Post Tertiary ...	In progress ... ... Recent and Pleistocene	Cainozoic or Recent and Tertiary		Largely represented....	Gold gravels, sand, clay, cement, gravel, drift, limestone, lignite, &c. ... ... Contemporaneous volcanic rocks...	Nos. 4 & 5 on geological map, Sign
Tertiary ...	Pliocene ... ... Miocene ... ... Eocene			Hamilton, Geelong, Cape Otway, &c. Mt. Eliza beds; clay, limestone, &c.	Marine fossils abundant.	
Cretaceous ...	Chalk ... ... Greensand	Mesozoic or Secondary	Upper Mesozoic	Represented by Grampian, Bacchus Marsh, Mansfield, Mt. Tambo, Ben Cruachan, Avon River, Buchan, &c.; and "carbonaceous" beds—Barrabool, Cape Otway, Western Port, Cape Patterson and Wannon, Nos. 7 and 8.		Nos. 7, 8, and 16 on geological map, Signs
Oolitic	Wealden ... ... Oolite ... ... Lias		Lower Mesozoic		"Carbonaceous" or coal-bearing beds—Cape Patterson Cape Otway, Traralgon, Welshpool, and Wannon ... Tæniopteris and Zamites-beds and Unio...	
Triassic ...	Saliferous... ... ... Mushelkalk ... ... Upper new red sandstones					
Permian ...	Magnesian limestone ... ... Lower new red sandstone	Palæozoic or Primary	Upper Palæozoic		Kyneton, Bacchus Marsh, Ballan ... ... Gangemopteris M'Coy	
Carboniferous	Coal measures ... ... Millstone grit ... ... Mountain limestone ... ... Lower coal measures				Grampians	
Devonian or Old Red Sandstone	Upper ... ... Middle with fossiliferous limestone Lower				Mansfield, Mt. Tambo, Avon River } Lepidodendron ... ... Buchan, Bindi, and Mansfield limestones	
Silurian ...	Upper silurian ... ... Lower silurian ... ... Cambrian...		Lower Palæozoic	"Bed rock" of all the gold-fields* ...	East of Melbourne and west of Mt. Useful ... ... West of Melbourne and Heathcote and east of Mt. Useful	No. 9 on geol. map, Sign.
Laurentian						
Metamorphic & Igneous of all ages	Mica and chlorite schists ... ... Gneiss and granitoid schists... ...	Hypozoic		Upper Glenelg and North-east Gippsland.		

* The Gold is sometimes found on a Granite "bottom," especially near its junction with the Lower Palæozoic rocks.

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MAPS, REPORTS, AND PAPERS

PUBLISHED BY

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43. do. 20. S.E., Cocoroc.
44. do. 20. S.W., Rothwell.
45. do. 21. N.W., Point Cooke.
46. do. 23. N.E., Portarlington.
47. do. 23. N.W., Point Wilson.
48. do. 23. S.E., St. Leonard.
49. do. 22. S.W., Point Henry.
50. do. 24. N.E., Moranghurk.
51. do. 24. S.E., Geelong.
52. do. 28. N.E., Duneed.
53. do. 28. S.E., Puebla.
54. do. 29. N.E., Queenscliff.
55. do. 29. N.W., Lake Connewarre.
56. do. 29. S.W., Bream Creek.

Scale of 2 inches to a mile.

57. Map of the Cape Otway District, half-inch to one mile.

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1. Report on the Geology and Mineralogy of Mount Alexander and adjacent country, 1853, C. 12, with plan.
2. Report of Geological Surveyor on the coalfield near Cape Patterson, 1853-54, A. 39, with plan and section.
3. Geological Surveyor's Report on the Geology, &c., of the country between Melbourne and Western Port, 1854, A. 21 a., with plans and sections.
4. Report on the Geological Structure of the Colony, the Basin of the River Yarra, &c., 1855-56, A. 108 a., with plans and sections.
5. Report of Progress of Survey from date of commencement, 1856, 29 a.
6. Report on the Economical Adaptability of the System of Artesian Wells to Victoria, 1856-57, C. 41 a, with plan and sections.
7. Appendix to Progress Report from Select Committee on Coalfields, 1856-57, D. 60.
8. Geological Surveyors' Report, 1857-58, A. 46.
9. Geological Notes of a Journey in South Australia, 1859, 20.
10. Copy of Despatch to Lord Stanley, and Report of Geological Surveyor, 1859-60, C. 7.
11. Geological Surveyor's Report, 1859-60, A. 28.
12. Short Description of the Geology of Victoria, Fairfax's Handbook to Australasia, 1859.
13. Reply to Questions put in Parliament for Geological Returns, 1860-61, A. 33.
14. Report relative to the Geological Survey of Victoria, 1861-62, A. 43, with plan, sections, and plates.
15. Essay on the Geology of Victoria, Exhibition Catalogue, 1861.
16. Reports and Papers relative to the Mining and Geological Survey, 1862-63, A. 36, with plan and section.
17. Report on the Geology of the district from Bacchus Marsh to Bass' Straits, 1863, Public Lands Circular, No. 8, vol. II.
18. Report of the Acting Director of the Geological Survey on the Wood's Point Goldfields, 1864, A. 1.
19. Gold and Silver bearing Reefs at St. Arnaud, 1864, No. 44.
20. Report on the Geological Survey, 1864-65, 44, with plan and section.
21. Report on Salt-producing Lakes, 1866, C. 2.
22. Report on Auriferous Drifts and Quartz Reefs, 1866, C. 6, with sections.
23. Report on the Geology of the District of Ballan, 1866, 15.
24. Reports relative to the Geological Survey, 1866, 14, with plan and sketch of workings and silver lodes, St. Arnaud.

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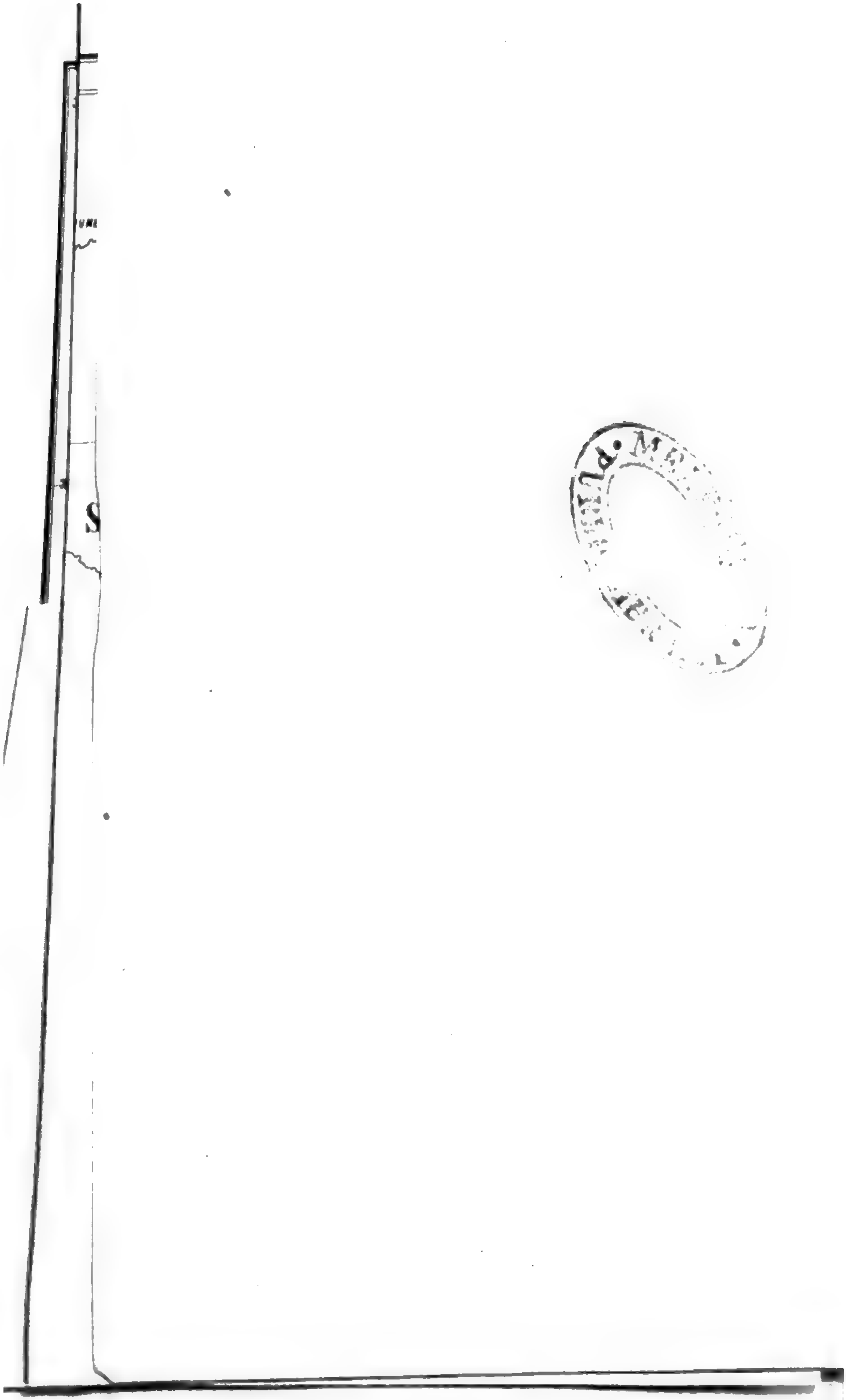
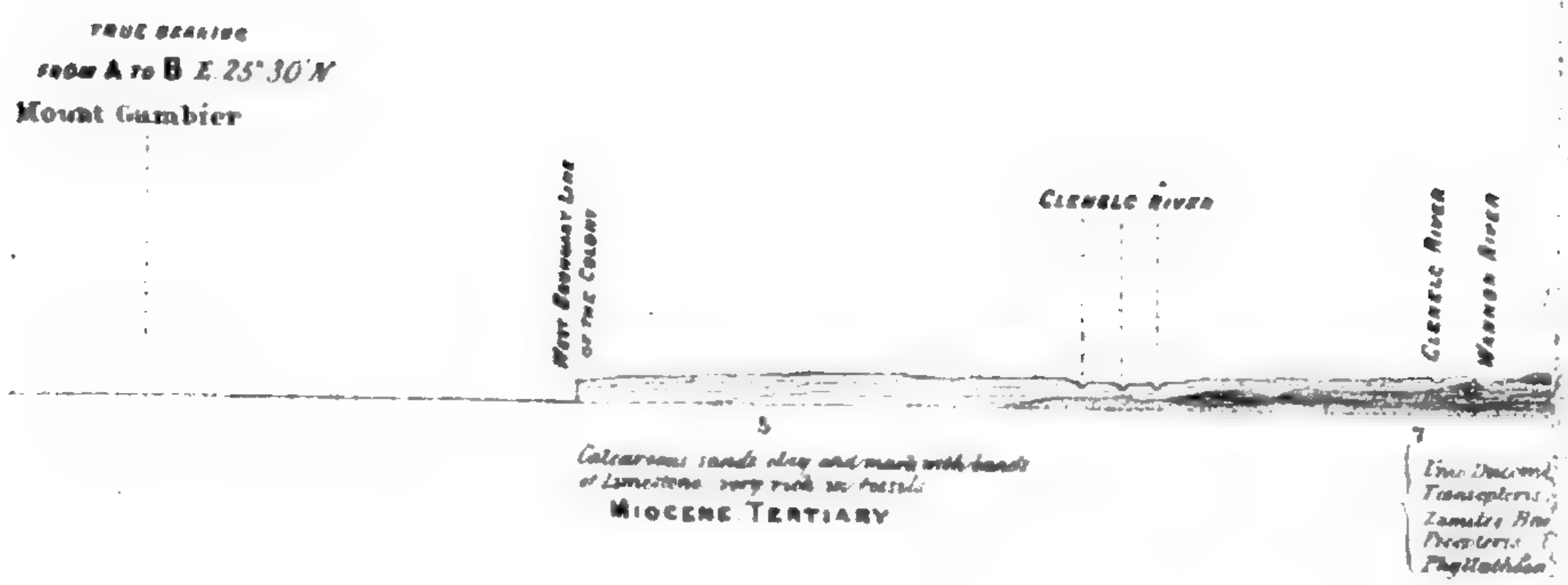

S

(Plate II.)



Geological Survey Office, Melbourne, Oct.r 1866

(*Plate II.*)

Geological Survey Office, Melbourne, Octr 1866

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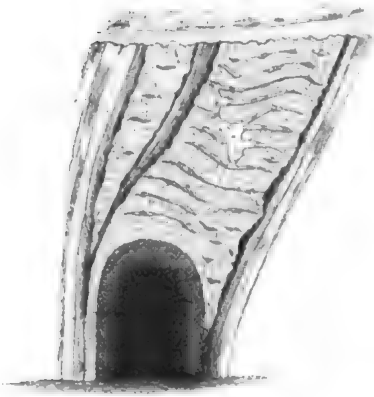
Pliocene
Silurian
Pliocene
Miocene
Silurian
Pliocene
Silurian
Slate Sandstone &c.
Pliocene
Silurian

SKETCH
of
Shakespere . Reef
GAFFNEY'S CREEK

"A Diorite Dyke traversed by auriferous quartz veins"



Cross section of Dyke at entrance of Tunnel

Left hand side wall of Tunnel about 70 ft from entrance
Strike of Dyke N 30° W Dip about 60° Northward.

Diorite Quartz Slate Alluvium

Plate V.

INTERCOLONIAL EXHIBITION ESSAYS, 1866-67.

No. 4.

ON GEMS AND PRECIOUS STONES

Found in Victoria.

BY THE REV. JOHN J. BLEASDALE, D.D.,

FELLOW OF THE GEOLOGICAL SOCIETY, AND OF THE LINNÆAN SOCIETY OF LONDON, &c.

GEM STONES OF VICTORIA.

The Intercolonial Exhibition did not add so much to our previous knowledge of gems and precious stones, either as to variety, quantity, or rare specimens, as was anticipated.

According to the plan followed of exhibiting the produce of a district altogether in its own court, the gem stones were unavoidably distributed through a number of small collections, and could not be viewed as a whole. Still there was abundance of new matters to cause regret that the mining population of the districts whence they are chiefly derived pay so little attention to collecting them. The districts hitherto yielding gems in the largest quantity, as well as of the greatest rarity and purity, are—Beechworth, where the only well-authenticated specimens of diamonds have been discovered; Talbot and Mount Greenock, whence the finest blue topazes have come; Jim Crow Ranges, which have yielded many fine zircons and specimens of green sapphire; and Donnelly's Creek, in Gippsland, whence I have obtained the finest green sapphires, some of great size and beauty.

Whilst drawing up this essay I received from Professor Maskeleyne, the curator of the mineralogical department of the British Museum, London, a letter on the subject of gems and precious stones, in reply to one enclosing him a few Victorian specimens which I could spare when arranging my own collection for the Exhibition. Professor Maskeleyne, both by education, taste, and special opportunities of examining rare specimens, may be safely taken as one of the best living judges of gem-stones, and anything coming from him is entitled to confidence and respect. He writes :—" Your precious stones are very interesting, and I hope Paris will see a fine display of those you have been collecting. The Hyacinths (zircons) in particular interested me. Of these, one long terminated prism is a very pretty specimen; and two others, of a pale blue colour, are even more interesting. I have been trying for years to get a good cut hyacinth; not the garnet kind, so called, but the true amaranth zircon. I believe Australia will one day supply it! The specimens you sent me are prettier and more interesting in every way than those from Expailly, in Auvergne. Chrysoberyls will, perhaps, turn up some day of fine quality; but your sapphires, for purity of blue, promise well indeed! I don't quite know what to say about the green sapphires you mentioned in your notice till I can see some specimens.

The emerald-green colour I never saw of *deep hue*, nor, I believe, have the jewellers; the paler green is not so extremely rare, nor is a kind of a sort of beryl colour—a deep bluish-green."

DIAMONDS.

Besides the Beechworth diamond, cut and mounted, there were in the Exhibition a considerable number, some of more than two carats weight, but all remarkable for the perfection of their crystallographic characters. As crystals, nearly all were exceedingly beautiful, and but little fault could be found with their colour.

The following extract will be read with interest. It is taken out of the Essay by R. Brough Smyth, Esq., "*On Mining and Mineral Statistics:*"—"According to a statement prepared last year by Mr. Barnard, who was then Warden at Beechworth, it appears that forty diamonds had been found, from one-eighth of a carat to two and a half carats; and the Mining Surveyor reported, on the 31st December, 1864, that a Chinaman had found a diamond at Sebastopol, weighing 17·64 carats. Mr. Gaunt, the Warden at Beechworth, reports that fifteen diamonds have been found in a claim belonging to Mr. Finn, at the Woolshed, during the year 1865; they weighed from half a carat to one carat. The numbers, as reported, therefore stand thus:—

Previously—Up to 31st December, 1864	41
From 1st January to 31st December, 1865	15
	56*"

At present diamonds are excessively dear. The following prices are taken from the last work on the subject, and that work written by one of the largest dealers in them in England, Harry Emanuel. Of course these are the prices of *faultless* stones :—

DIAMOND.

A brilliant	weighing	1	carat	£18
,,	,,	$1\frac{1}{2}$	,,	38
,,	,,	2	,,	65
,,	,,	3	,,	125

The only locality from which I have *seen* the diamond is Beechworth, though I have been assured that one or more have been found in North-east Gippsland. Taking the cautious and learned traveller and mineralogist Mawe as an authority, I may here express surprise that no diamond has been reported from Moonambel, Mountain Creek, or Mount Greenock, where the blue topaz occurs. Speaking of the beautiful blue topaz, he says—"It occurs along with chrysoberyl, in that conglomerate which we have already mentioned as the repository of the diamond." It must be remembered that he mentions—and our own experience confirms it—that the formation in which the blue topaz occurs is quite different from that in which the yellow topaz is found. I am not aware that one yellow

* The owners of twenty-two of these are known.

topaz has yet been found, while we have discovered blue ones equal to the finest known specimens from other countries. This leads me to point attention to the fact, well known in Brazil, that wherever the blue topaz is found there also the diamond may be looked for. Mr. Turner's collection, in which were some good small blue topazes from Beechworth, so far confirms the statement of Mawe. It may not be out of place here to say that I look forward with some anxiety and much hope to the day when the labours of the Geological Department, so well and so carefully carried out in other districts, shall be extended to those where the diamond has been found; and if I might do so without offence, I would take this opportunity, while the interest raised by the late Exhibition is still fresh in the minds of those most interested, to hint that the special examination of the districts about Beechworth should receive the earliest possible attention of the Geological Department; for it is not by individual labour, but only by the careful examinations of a staff from that department, so ably presided over by Mr. Selwyn, that we can expect finality in this direction.

CORUNDUM—THE SAPPHIRES.

Of this important class of gem stones it seems to me that no one country in the world can boast of so large a variety. Whatever may be said of the perfection in size and colour of particular stones, it nevertheless does appear that in no known country has there been brought together so great a variety of sapphires; and if this can be said of the results of accidental discovery, surely something more might reasonably be expected had a systematic search been instituted. In reality we owe nearly all our knowledge to the circumstance of these crystals having persistently asserted their greater specific gravity, and having therefore clung to the gold till it came to the last operation of cleansing in the tin dish! What had been thrown away with the larger pebbles no man can tell; but it is the same in all nature; where you find small stones there are larger ones not far off.

Not altogether out of place will be an anecdote related to me at least nine years ago, and before a single sapphire had been reported by the diggers, by my friend Mr. Crisp, of Queen-street. In the course of a conversation with him on the subject I am now dealing with, I had asked him for any information he possessed, when he told me of several matters brought to him, and then added—"I have found but one sapphire, and that I got out of *the craw of a wild duck:* curiosity led me to examine the miscellaneous collection of stones in its gizzard, when I found a true dark blue sapphire." I never doubted the truth of this; but the Exhibition brought out such an abundance of small sapphires from *Dandenong Creek*, as to render it rather a wonder that more have not been found under like circumstances, than that he should have discovered the one I now mention.

Of sapphires, then, the Exhibition brought together satisfactory specimens of the following kinds and colours:—Indigo blue, pale azure, deeper azure, the *true* azure, the green or Oriental emerald, of which

several specimens were very large and fine, and a few well cut by Mr. Spink, of Melbourne, out of specimens supplied by myself and Mr. M. Stephen, now of Beechworth. There were also many samples of the hair brown variety, the adamantine spar, quite a number of asteriæ, the star sapphire, but all, save three, of a dark yellowish brown colour, but most perfect in their six-rayed star and their crystallographic characters. In my collection, as well as that of Mr. Turner and Mr. M. Stephen, was a curious variety of the star sapphire, having a jet black fixed star of six rays, with a black centre, and a fine float of white light over the surface, as cut *en cabochon*. I exhibited several sapphires cut by Mr. Spink, of an opaque or slightly translucent character, which yielded the true character of a cat's eye—but again they differed from the onyx cat's eye, in being of a darkish peculiar colour. I also showed several in the rough. Uncut were a few long crystals of the yellow variety, the Oriental topaz, as also one or two crystals of the grayish-blue variety of the star sapphire.

Concerning the price likely to be obtained for blue sapphires of good colour, and more than twelve grains weight, it is extremely difficult to give any definite idea. Were they found in tolerable abundance in this country, and cut, there is every reason to think they would command a comparatively high price among our own people, solely on account of their great hardness and splendid colour and lustre. So few have yet been obtained, that one of two things may still happen in any given case—either the possessor will make you a present of it if you ask him, or he will demand a purely sporting price. Still, there is no fear that if they are found in abundance, and of good colour, they will soon be eagerly sought for, and we shall see the "rank and fashion" of the colony arrayed in really precious gems worth a fair value anywhere, instead of the trumpery, foiled rubbish so universally met with now-a-days.

RUBIES.

Of rubies we had only their representative actually in the Exhibition, an opaque red corundum stone, described and named by Mr. Stephen—Barklyite—after our late Governor, Sir Henry Barkly.

There is no doubt, however, that the true Oriental ruby was found by Mr. Ulrich, near Mount Eliza, on Port Phillip Bay. He assured me he had subjected it to every known test of its purity. I may mention that lately I saw a genuine specimen from New Zealand. Last year I exhibited at the Royal Society a star ruby, found in Queensland, and cut in Melbourne, the size of a small horse bean, and very fine both in colour and in the star it displayed.

Any of the above are admirably suited for ring-stones, either for ladies or gentlemen; and would certainly be much more becoming than the bits of blood-stone and carnelian which are so generally worn by gentlemen now-a-days; while in the case of ladies' bijouterie, the real sapphire would be a vast improvement upon vinegar garnets, and either imitation or bad emeralds set with foil, and sure to be ruined the first time they are immersed in water.

GREEN SAPPHIRE
(The Oriental Emerald).

The rare and most precious green sapphire (Oriental emerald) is at present but little known, though it appears to occur quite commonly on the Ovens, in North Gippsland, and near Daylesford. I have seen large specimens of this stone from each of those places. Harry Emanuel says—"The green variety (of sapphire) is the rarest of all gems, and is scarcely ever seen. In the whole course of my experience I have only met with one specimen." (*Page* 115.) Of course it is impossible to place a fair value on a fine specimen of this rarest of minerals. One found near Donnelly's Creek was cut for exhibition by the Commissioners at the Intercolonial Exhibition, and was an object of much interest and curiosity. It was mounted as a ring-stone.

SPINELS.

I have not yet seen any specimens of this gem-stone fit for cutting and polishing. I have met with small transparent ones, but their colour was for the most part poor, and no value whatever could be attached to them. Some few of the collection of G. Milner Stephen, Esq., found about Beechworth, were pretty and interesting, as showing the presence of this class, but otherwise of no consideration.

I have taken the liberty of making an extract from an article on precious stones, in a recent number of the *Edinburgh Review*, evidently written by a master of the subject, which will be of interest to the general reader, and may prove of use among our own mining population:—

"The next species to be described is that comprised in a well-marked mineralogical group termed the spinels. It is, however, only with the transparent and more precious forms of this mineral that we have to do. The name is traced to the Greek σπίνος, connected in its root with σπινθὴρ, a spark. Precious varieties consist essentially of alumina combined with magnesia, and tinted perhaps with iron. Their colour is more limited than in the case of the corundum varieties, but it includes two resplendent stones, namely, the spinel ruby, a scarlet variety of considerable fire and of rich colour; and the balais, or ballast ruby, called from one of the most celebrated localities of the spinel in former times, namely Beloochistan or Balastan. The latter is of a delicate and rarely deep rose colour, showing a blue tint when looked through, and a redder one when it is looked at. Both of these minerals are termed rubies by the jewellers, and the deeper tinted kinds are sometimes sold for the true ruby. Nearly all the large and famous stones that pass under the name of rubies belong to this species; such is the ancient ruby in the crown of England, which was presented to Edward the Black Prince by Don Pedro the Cruel, and such the enormous stone, time-honoured in Indian tradition, that accompanied the Koh-i-Noor into the possession of Her who is now the Sovereign of India. An orange-red variety of the spinel is known by the name of the rubicelle. There are also varieties, the one of a pale Berlin blue and the other of a "duck blue" containing much green, which are rare and curious rather than beautiful forms

of the spinel. It also sometimes occurs with a tint containing more blue than the balais ruby, and approaching the almandine garnet in hue, though generally paler; a variety which has received the name of the almandine ruby."

TOPAZES.—COLOURS: WHITE, BLUE, AND PINKISH.

White topazes are very numerous, and of them we had some fine specimens from Beechworth, Gippsland, and, remarkably, from Flinders Island, in the Straits. This may be said of those from Flinders Island, that they possess very great fire and beauty when cut, and are nearly all of a pale yellowish shade in the rough. In the Tasmanian Court there was a magnificent collection, both cut and uncut, of which not a few were of large size. There were plenty of blue ones from Beechworth, and some in my collection from near Talbot. But I had not any of the exceedingly large ones from the last-named locality, which attracted so much attention on the occasion of a conversazione, held in the Hall of the Royal Society a year ago. They had passed into private hands, and could not be easily traced.

No yellow topaz has yet been found that I could ever hear of for certain. All those shown to me were quartz—the cairngorm stone.

I may add that the Exhibition brought out nothing fresh as regards the crystallographic character of the white and blue topaz. It was in every instance obscure to the eye, such as presented by rolled pieces, or rather water-worn specimens; but those from Flinders Island were more distinctly marked in their outline than their Victorian neighbours.

I may venture to say that there is not in the world a stone fit for brooches, of size, and fire, and lustre, and suited to both day and candle light, equal to some of the blue topazes which I have known to be found in Victoria. On former occasions I have met with blue topazes found in Victoria, both cut and mounted, and in the rough state, of a quarter of a pound weight, perfect in colour, and, considering their great size, almost faultless. Most of these were from about Mount Greenock and Talbot.

ZIRCONS AND HYACINTHS.

The zircon family is most abundant over the gold regions of Victoria. I have seen them of several distinct colours and shades of colour.

In my own collection are a few remarkably beautiful crystals, and rolled lumps of a very dark red colour, and perfectly clear. I exhibited one or two small white ones, cut, but regret to say that I have failed to discover the owner of one of great beauty, which I saw when being cut by Mr. Spink, and said to have come from Gippsland. It was free from the sombre tint so often seen in the white zircon.

Of hyacinths there were in the Exhibition a considerable number, both cut and in the rough, found in Ballarat, near Daylesford, and the Crooked River. Along with the cut specimens I exhibited some fine ones from India, Indian cut, alongside of which our own lost nothing in comparison. This gem is perhaps too much underrated, on account of

its somewhat brick-red colour; but it must be remembered that it is a fine stone for artificial light, and free from the blackness which so detracts from the beauty of the garnet in any but daylight. Since these gems are very abundant on nearly all the gold-fields, I cannot help thinking that if they were prized as they ought to be by the public, the lapidary would get over his dislike to them, and devise means for imparting to them their full measure of polish. May I venture to hope that the extract from Professor Maskeleyne's letter on the opening page of this Essay, will improve our opinion of this class of gem stones.

BERYLS.

It is uncertain whether any aquamarines have as yet been found in Victoria. I have a few in my collection, but I am wholly ignorant of the country from which they have been brought. Not unfrequently the pale blue topaz is mistaken for the aquamarine, but never if the hardness and specific gravity be attended to.

Lately, my reverend friend, W. B. Clarke, the eminent geologist and mineralogist, of Sydney, has sent me a list of his discoveries, which I have appended;* and in it he informs me that he found in some granite a fragment of true emerald. In working granite quarries these most valuable gems may be at any time discovered.

OPALS.

Perhaps the next in order as gems are the Opals. Of these we have beautiful specimens of the true *noble* opal, found at Beechworth. I saw three specimens in the hands of diggers, more than two years ago, at

* He writes:—"Now, as to the gems in New South Wales, they are no doubt numerous, but are chiefly confined to the goldfields. In my book on the southern goldfields I have appended two notes, in which you will see mention of some that I had met with at the time of publication. I sent you a copy of the book a few days since. Lately we have found more diamonds about the same locality—Suttor's Bar, on the Macquarie River. None of them are of considerable size. Sapphires red and blue, both dark and light coloured (I have also seen the *star* ruby), and topaz are very common, and some of the latter are of large size, but water-worn. Almandine garnet is not uncommon. The common garnet is abundant. Chrysolite is very common. Chrysoberyl has also been found; and near Cooma, in granite, I once found a fragment of an emerald. *All* the varieties of quartz have been found, including amethyst. In the Uralea River, New England, the amount of sapphire and ruby is enormous. The diggings there are in granite detritus, over granite and under basalt. We have *tin* crystals and water-worn corundum in abundance. I have seen a *blue tourmaline*, also epidote proper; and the magnesian variety also occur here. Among other things in this way I have procured very beautiful dodecahedral crystals of gold. Zircon, hyacinth, &c., have also been found by me." This list informs us that some very fine stones have been found, at least in their substance, whatever may be their individual value as gems, in New South Wales, and in the southern goldfields. Chrysolite, chrysoberyl, and the star-ruby are all valuable, and the last-named one is probably beyond all price, as compared with gold, if it be found of considerable size and strength of colour.

Beechworth, which were of great size—quite an inch long—much water-worn. I much regret that these were not sent to the Intercolonial Exhibition.

I exhibited perhaps the finest *fire* opal yet found in Victoria, which I obtained from a digger at Beechworth, and got cut and polished by Mr. Spink. This particularly fine stone, one part of which was cut off for a specimen, attracted the curiosity of the curious in these matters, for its size and beauty. The *fire* opal, when of good size, is everywhere justly esteemed as a fine stone.

GARNETS.

Garnets were exhibited in very considerable quantities. In my collection alone were more than a quarter of a pound weight; among them several of good size and fine colour. I have never yet seen a Victorian garnet of any but one tint—the Almandine.

TOURMALINES.

The specimens of this stone, found in the granite from the Ovens district, were mostly opaque. The only *clear* crystal that I remember in the Exhibition, that was undoubtedly Victorian, was one in my collection, found by myself in granite rubbish close to a bridge, between Benalla and Wangaratta. I thought I had found a specimen in the granite used for the foundation of Sandhurst Gaol, but am not quite sure of it. I call attention to this matter here, for the purpose of interesting some one in keeping an eye to such matters when working the quarries from which that stone was obtained, near Sandhurst. The large concretions of many different substances here and there visible in it was suggestive of other matters besides tourmaline, such as beryl, the emerald, garnets, &c.

In my collection was a dark-green tourmaline, step-cut, of rather more than three carats, which would compare favourably with many emeralds of the same size. This stone improves in artificial light. The yellow light suits the somewhat bluish-green, and raises it to almost perfect grass-green. If this stone prove to be abundant in Victoria, it will soon be a favourite, and bring a good price.

PEARLS.

The Exhibition brought together a few samples. Mr. C. D'Oyley H. Aplin, of the Geological Survey, showed a few from Port Essington, but their "orient" was not good. Three or four, found in the river Yarra Yarra, were decidedly better, both in form, lustre, and colour.

Whether the true pearl oyster has been found about our shores or bays, I am unable to state. I was informed that these stones were found in a variety of the mussel.

No gem was so sparingly represented in the Exhibition, whether by native or foreign specimens, as the pearls.

THE QUARTZ ORDER.

The Exhibition brought together a vast variety of specimens of this class, both wrought and in the rough, and embracing nearly if not quite every known colour. Smoky quartz and cairngorms, as they are called, were in great abundance, as also pure white crystals, and water-worn lumps, and amethysts of every shade of purple, but falling somewhat short in colour, when compared with the best of those of Ceylon and Siberia. These stones occur all over the colony, but have been mostly found where digging for gold is carried on. Among the exhibits of Mr. Turner, of Beechworth, were a number of exceeding beauty and size, exquisitely cut, and tastefully set as brooches and ladies' ornaments.

Chalcedony, chrysoprase, and agates, in great variety, came up from Beechworth, chiefly from the Woolshed Creek and Sebastopol. Spink and Son exhibited very many, most of them being of fine quality.

PRECIOUS STONES.

We may here very properly draw a broad distinction between gems and *precious* stones. Every gem is a precious stone, but not *vice versâ*.

For the purpose of clearness in this report, they have been separated, mainly, though not solely, by their opacity.

Of this latter kind the Exhibition showed a brilliant collection of beautifully cut specimens of malachites, agates from Cooper's Creek and the Ovens, ribbon jasper, and blood-stones. These were so exposed as to be readily compared with wrought specimens from Scotland, Egypt, Ceylon, India, Germany, &c. They were mostly cut for brooch stones.

That gem stones will one day form an important article of Victorian produce, scarcely any one can reasonably doubt. Yet before the full development of these precious resources of wealth can be reached, many changes, I anticipate, must be brought about, not so much as regards cheapness of labour, to enable them to be profitably sought for, as in the tastes and fashions of our fellow-colonists—shall I say our lady fellow-colonists? Surely we shall not have to wait till London, and Paris, and Florence have spoken out in admiration of our native gems! And yet there is nothing more likely just now. But when we reflect upon it, what an exposure of ignorance and want of taste this exhibits! While it is strictly true that one can scarcely enter a house, a public place of any kind, or walk the length of a short street, without meeting with some one bedizened with jewellery—rings, brooches, waist buckles, necktie-holders, &c.—I may say, without fear of reproof, that hardly one thing in a hundred is in good taste, and a smaller number still exhibit gem stones of any value, though stones of real value might be procured and mounted for perhaps less than has been paid for these tawdry trifles.

And then, again, the jewellers' and goldsmiths' windows of this city are, with a few bright exceptions, literally crowded with these trashy articles: stones got up with a foil—even if they are stones at all, and not mere paste or glass—and mounted in gold, which they only disgrace. I will mention purposely in this place one shameless violation of taste that has been painfully common of late in the shop windows of the

great mass of vendors of colonial jewellery, viz.: a brooch representing a leaf, having a coloured stone mounted somewhere in it, generally in the most conspicuous place, and where it can neither represent nor symbolise any mortal thing in universal nature. Yet the very abundance of such like articles is an evidence of the "run" they have just now in the Victorian market.

What a contrast to this "rubbish in gold" were some brooches lately to be seen, formed of good gold, and chastely engraven to represent truly a small frond of a beautiful native fern; and some others, copies in gold of a few leaves and the flower of the silver wattle. And yet an article such as this, in good taste, would probably not cost more than half as much as that tawdry, impossible abortion of a leaf unknown to botanists, badly engraved, and rendered ridiculous by a wretched imitation of a ruby or emerald, placed where nature never placed either ornament or fruit.

There is room, no doubt, for a great change for the better in the tastes and fashions of the great bulk of those who wear articles of jewellery; and the sooner it is effected the better for the encouragement of those who, if sufficiently induced, would seek for our own fine colonial gems.

INTERCOLONIAL EXHIBITION ESSAYS, 1866-67.

No. 5.

AUSTRALIAN VEGETATION,

Indigenous or Introduced,

CONSIDERED ESPECIALLY IN ITS BEARINGS ON THE OCCUPATION OF THE TERRITORY, AND WITH A VIEW OF UNFOLDING ITS RESOURCES.

BY FERDINAND MUELLER,

PH.D., M.D., F.R.S.,

DIRECTOR OF THE STATE GARDEN OF MELBOURNE.

AUSTRALIAN VEGETATION.

The great continent of Australia exhibits throughout its varied zones marked diversities in the physiognomy of its vegetation. These differences stand less in relation to geographical latitudes than to geological formations, and especially climatical conditions. Yet it is in few localities only where the peculiar features, impressed by nature as a whole on the Australian landscape, cannot at once be recognised. The occurrence of eucalypts and simple-leaved acacias in all regions, and the preponderance of these trees in most, suffice alone to demonstrate that in Australia we are surrounded largely by forms of the vegetable world which, as a complex, nowhere re-occur beyond its territory, unless in creations of ages passed by.

In a cursory glance at the vegetation, as intended on this occasion, it is not the object to analyse its details. In viewing vegetable life here, more particularly as the exponent of clime, or as the guide for settlement, or as the source of products for arts and manufactures, we may content ourselves by casting a view only on the leading features presented by the world of plants in this great country. While the absence of very high and wooded mountains imparts to the vegetation throughout a vast extent of Australia a degree of monotony, we perceive that the occurrence of lofty forest ranges along the whole eastern and south-eastern coast change largely there the aspect of the country, and in this alteration the mountainous island Tasmania greatly participates. Thus the extensive umbrageous forest regions of perpetual humidity commence in the vicinity of Cape Otway; extend, occasionally but not widely interrupted, through the southern and eastern part of Victoria, and thence, especially on the seaside slopes of the ranges, throughout the whole of extra- and intra- tropical East Australia in a band of more or less width, until the cessation of elevated mountains on the northern coast confines the regions of continued moisture to a narrow strip of jungle-land margining the coast. In this vast line of elevated coast-country, extending in length over nearly 3000 miles, and which fairly may pass as the "Australian jungle," the vegetation assimilates more than elsewhere to extra-Australian types, especially to the impressive floral features of continental and insular India. Progressing from the Victorian promontories easterly, and thence northerly, we find that the eucalypts, which still preponderate in the forest of the southern ranges, gradually forsake us, and thus in Eastern Gippsland commences the vast assemblage of varied trees, which so much charms by its variety of forms, and so keenly engages attention by the multiplicity of its interest. Bathed in vapour from innumerable springs or torrents, and sheltered

under the dark foliage of trees very varied in form, a magnificent display of the ferntrees commences, for which further westerly we would seek in vain the climatic conditions. Even isolated sentries, as it were, of the ferntree-masses are scattered not further west than to the craters of extinct volcanoes near Mount Gambier, and although colossal *Todea-ferns*, with stems six to ten feet high, and occasionally as thick, emerge from the streamlets which meander through the deep ravines near Mount Lofty, on St. Vincent's Gulf, we miss there the stately palm-like grace of the *Cyatheæ*, *Dicksoniæ*, and *Alsophilæ*, which leave on the lover of nature who ever beheld them the remembrance of their inexpressible beauty. These ferntrees, often 20 to 30, occasionally 50 to 70 feet high, and at least as many years old, if not older, admit readily of removal from their still mild and humid haunts to places where, for decorative vegetation, we are able to produce the moisture and the shade necessary for their existence. Of all ferntrees of the globe that species which predominates through the dark glens of Victoria, Tasmania, and parts of New South Wales, the *Dicksonia Antarctica* (although not occurring in Antarctic regions), is the most hardy and the least susceptible to dry heat. This species, therefore, should be chosen for garden ornaments, or for being plunged into any park glens; and if it is considered that trees half a century old may with impunity be deprived of their foliage and sent away to distant countries as ordinary merchandise, it is also surprising that a plant so abundant has not yet become an article of more extended commerce.

A multitude of smaller ferns, many of delicate forms, are harboured under the shade of the jungle-vegetation, amounting in their aggregate to about 160 species, to which number future researches in North-East Australia will undoubtedly add. The circular *Asplenium nidus*, or great nest-fern, with fronds often six feet long, extends to the eastern part of Gippsland, but the equally grand staghorn-ferns (*Platycerium alcicorne* and *P. grande*) seemingly cease to advance south of Illawarra, while in Northern Queensland *Angiopteris evecta* count amongst the most gorgeous, and two slender *Alsophilæ* amongst the most graceful forms. The transhipment of all these ferns offers lucrative inducements to traders with foreign countries. Epiphytal orchids, so much in horticultural request, are less numerous in these jungle tracts than might have been anticipated, those discovered not yet exceeding 30 in number. Their isolated outposts advance in one representative species—the *Sarcochilus Gunnii*—to Tasmania and the vicinity of Cape Otway, and in another—*Cymbidium canaliculatum*—towards Central Australia. The comparative scantiness of these epiphytes contrasts as strangely with the Indian orchid-vegetation, as with the exuberance of the lovely terrestrial co-ordinal plants throughout most parts of extra-tropical Australia, from whence 120 well-defined species are known. Still more remarkable is the almost total absence of orchids, both terrestrial and epiphytal, from North and North-West Australia, an absence for which in the central parts of the continent aridity sufficiently accounts, but for which we have no other explanation in the north than that the species have as yet there effected but a limited migration. To the jungles and cedar-brushes—the latter so named because they yield that furniture-wood so famed as the red cedar (*Cedrela taona*, a tree identical as a species with the Indian plant, though slightly different in its wood)—are absolutely confined the *Anonaceæ*, *Laurineæ*, *Monimieæ*, *Meliaceæ*, *Rubiaceæ*, *Myrsineæ*, *Sapoteæ*, *Ebenaceæ*, and *Anacardieæ*, together with

the *Baccate Myrtaceæ*, and nearly all the trees of *Euphorbiaceæ*, *Rutaceæ*, *Apocyneæ*, *Celastrineæ*, *Sapindaceæ*, which, while often outnumbering the interspersed eucalypts, seem to transfer the observer to Indian regions. None in the multitude of trees of these orders, with exception of our tonic-aromatic sassafras-tree (*Atherospermum moschatum*) and *Hedycarya Cunninghami*, which supplies to the natives the friction-wood for igniting, transgress in the south the meridians of Gippsland. Palms cease also there to exist, but their number increases northward along the east-coast, while in Victoria these noble plants have their only representative in the tall cabbage or fan palm of the Snowy River—that palm which, with the equally hardy *Areca sapida* of New Zealand, ought to be established wherever the date is planted for embellishment. Rotang palms (*Calami* of several species) render some of the northern thickets almost inapproachable, while there also on a few spots of the coast the cocoanut-tree occurs spontaneously. A few peculiar palms occur in the Cassowary country, near Cape York, and others around the Gulf of Carpentaria as far west as Arnhemsland. The tallest of all, the lofty Alexandra-palm (*Ptychosperma Alexdræ*), extends southwards to the tropic of Capricorn, and elevates its majestic crown widely beyond the ordinary trees of the jungle. The products of these entire forests is as varied as the vegetation which constitutes them. As yet, however, their treasures have been but scantily subjected to the test of the physician, the manufacturer, or the artisan. The bark of *Alstonia constricta*, like that of allied Indian species, is ascertained to be febrifugal, so that of *Chionanthus axillaris* and *Brucea Sumatrana*. Caoutchouc might be produced from various trees, especially the tall kinds of Ficus. The lustre and tint of the polished wood of others is unrivalled. Edible fruits are yielded by *Achras Australis*, *Achras Pohlmaniana*, *Mimusops kauki*, *Zizyphus jujuba*, *Citrus Australis*, *Citrus Planchonii*, *Eugenia myrtifolia*, *Eugenia Tierneyana*, *Parinarium nonda*, the candlenut-tree (*Aleurites triloba*), and the cluster fig-tree (*Ficus vesca*, which produces its bunches from the stem); also by species of *Owenia* and *Spondias*, and by several brambles and vines. Starchy aliment or edible tubers are furnished by *Tacca pinnatifida*, by several *Cissi* (*C. opaca*, *C. clematidea*, acrid when unprepared), *Marsdenia viridiflora*, *Colocasia antiquorum*, *Alocasia macrorrhiza*, by a colossal *Cycas*, some *Zamiæ*, and several kinds of yam (*Dioscorea bulbifera*, *Dioscorea punctata*, and other species). *Backhousia citriodora* and *Myrtus fragrantissima* yield a cosmetic oil; so also *Eucalyptus citriodora*, a tree not confined to the jungle, and two kinds of *Ocimum*. *Semecarpus anacardium*, the marking nut-tree, is a native of the most northern brush-country. The medicinal *Mallotus Philippinensis* and the poisonous *Excœcaria Agallocha* are more frequent. *Baloghia lucida* furnishes a red dye never to be obliterated.

Many of the trees of the coast-forests of East-Australia range from the extreme north to the remotest south, among them the *Palm-panax*; others, like *Araucaria Cunninghami*, extend only to the northern part of New South Wales, while some, including *Araucaria Bidwillii*, or the *Bunya-Bunya* tree, so remarkable for its large edible nutlike seeds, and the Australian Kauri, *Dammara robusta*, are confined to very circumscribed or solitary areas. The absence of superior spice plants (as far as hitherto ascertained) amidst a vegetation of prevailing Indian type is not a little remarkable, for *Cinnamomum Laubatii* ranks only as a noble timber-tree, and the native nutmegs are inert. The scantiness of acanthaceous plants

is also a noticeable fact. *Podostemoneæ* have not yet been found. Many plants of great interest to the phytographer are seemingly never quitting the north-eastern peninsula; among these the *Banksian banana (Musa Banksii)*, the pitcher-plant *(Nepenthes Kennedyana)*, the vermillion-flowered *Eugenia Wilsonii*, the curious *Helmholtzia acorifolia*, the marshal-tree, *Archidendron Vaillantii* (the only plant of the vast order of *Leguminosæ* with numerous styles), the splendid *Diplanthera quadrifolia*, *Ficus magnifolia*, with leaves two feet long, the tall *Cardwellia sublimis*, and the splendid *Cryptocarya Mackinnoniana*, are especially remarkable. *Rhaphidophora*, *Pothos*, *Piper*, together with a host of *Lianes*, especially gay through the prevalence of *Ipomœas*, tend with so many other plants to impart to the jungle part of Australia all the luxuriance of tropical vegetation. Of the two great nettle-trees, the *Laportea gigas* occurs in the more southern regions, while *Laportea photinifolia* is more widely diffused. *Helicia* is represented by a number of fine trees far south, some bearing edible nuts. *Doryanthes excelsa*, the tall spear-lily, is confined to the forests of New South Wales. The flowers of *Oberonia palmicola* are more minute than those of any other orchideous plant, although more than 2000 species are known from various parts of the globe. The display of trees eligible for avenues from these jungles is large. The tall fern-palm (*Zamia Denisonii*), one of the most stately members of the varied Australian vegetation, is widely, but nowhere copiously, diffused along the east-coast; it yields a kind of sago, like allied plants. The beans of *Castanospermum Australe*, which are rich in starch, and those of *Entada pursætha*, from a pod often four feet long, are with very many other vegetable substances, on which Mons. Thozet has shed much light, converted by the aborigines into food.

If plants representing the genera *Berberis*, *Impatiens*, *Rosa*, *Begonia*, *Ilex*, *Rhododendron*, *Vaccinium*, or, perhaps, even firs, cypresses, and oaks, do at all occur in Australia as in the middle regions of the mountains of India, it will be on the highest hills of North-East Australia—namely, on the Bellenden Ker Ranges, mountains still unapproachable through the hostility of the natives—where they will find the cooler and simultaneously moist tropical climate congenial to their existence. But whatever may be the variety and wealth of the primitive flora of East Australia, it is only by the active intelligence and exertions of man that the greatest riches can be wrought from the soil. Whatever plants he may choose to raise—whether costly spices, luscious fruits, expensive dyes; whether cacao, manihot, or other alimentary plants; whether sugar, coffee, or any others of more extensive tropical tillage—for all may be found wide tracts fitted for their new home.

The close access to harbours facilitates culture, while the expansive extent of geographical latitude on the east-coast admits of choosing such spots as in each instance present the most favourable climatic conditions for the success of each special plantation. Beyond the coast ranges the country westward changes with augmenting dryness generally at once into more open pastoral ground. Basaltic downs and gentle verdant rises of eminent richness of herbage may alternately give way to Brigalow scrubs, or sandstone plateaux, or porphyritic or granitic hills, and with the change of the geological formation a change, often very apparent, will take place also in the vegetation. Inland we will lose sight of the glossy, dense, umbrageous foliage, which now only borders a generally low coast in the

north, terminating there frequently in mangroves. *Strychnos nux vomica* occurs among the coast bushes here, and also an *Antiaris (A. macrophylla)*; but whether the latter shares the deadly poison of the Upas tree of Java and Sumatra requires to be ascertained. *Tamarindus Indica* is known from Arnhems-land, and the French bean *(Phaseolus vulgaris)* in a spontaneous state from the north-west coast. Eucalypts, again, form away from the sea the prevailing timber, but with the exception of the red gumtree *(Eucalyptus rostrata)*, which lines most of the rivers of the whole of the Australian interior, the southern species are replaced by others, never of gigantic growth, in some instances adorned with brilliant scarlet or crimson blossoms. But neither these nor many distinct kinds of northern *Acacias* and *Melaleucas* stamp on the country the expression of peculiarity. Familiar Australian forms usually surround us, though those of the cooler zone, and even the otherwise almost universal *Senecios*, are generally absent. *Cyperus vaginatus*, perhaps the best of all textile rushes, ranges from the remotest south to these northern regions. *Hibiscus tiliaceus*, with other malvaceous plants, is here chosen by the natives for the fibre of their fishing nets and cordage. An occasional interspersion of the dazzling *Erythrina vespertilio*, of *Bauhinia Leichhardti*, *Erythrophlæum Laboucheri*, *Livistonia palms*, and many *Terminaliæ*, some with edible fruits, *Cochlospermum Gregorii*, *C. heteronemum*, remind, however, of the flora of tropical latitudes, which, moreover, to the eye of an experienced observer is revealed also in a multitude of smaller plants, either identical with South Asiatic species or representing in peculiar forms tropical genera. The identity of about 600 Asiatic plants (some cosmopolitan) with native Australian species has been placed beyond doubt, and to this series of absolutely identical forms, as well derived from the jungle as from grounds free of forest, unquestionably several hundred will yet be added.

Melaleuca leucadendron, the *Cajeput*-tree of India, is among Indo-Australian trees one of the most universal; it extends as one of the largest timber-trees of North Australia along many of its rivers, and in diminutive size over the dry sandstone table-lands. The Asiatic and Pacific *Casuarina equisetifolia* accompanies it often in the vicinity of the coast. By far the most remarkable form in the vegetation of North-West Australia is the Gouty-Stemtree *(Adansonia Gregorii)*; but it is restricted to a limited tract of coast-country. It assumes precisely the bulky form of its only congener, the Monkey-Breadtree, or Baobab of tropical Africa *(Adansonia digitata)*, dissimilar mainly in having its nuts not suspended on long fruit-stalks. Evidence, though not conclusive, gained in Australia, when applied to the African Baobab, renders it improbable that the age of any individual tree now in existence dates from remote antiquity. This view is also held by Dr. G. Bennett, of Sydney. The tree is of economic importance; its stem yields a mucilage indurating to a tragacanth-like gum. It is also one of the few trees which introduces the unwonted sight of deciduous foliage into the evergreen Australian vegetation. Numerous swamps and smaller lakes exist within moderate distance of the coast; as in many other parts of Australia, these waters are surrounded by the wiry Polygonum *(Muehlenbeckia Cunninghami)*, and in Arnhems-land occasionally also by rice plants, not distinct from the ancient culture-plant. But here, in almost æquinoctial latitudes, the stagnant fresh waters are almost invariably nourishing two waterlilies of great beauty *(Nymphæa stellata* and

Nymphæa gigantea), which give, by the gay display of their blue, pink, or crimson shades of flowers, or by their pure white, a brilliant aspect to these lakes; and even the Pythagorean bean *(Nelumbo nucifera)* sends occasionally its fine shield-like leaves and large blossom and esculent fruits out of the still and sheltered waters. But how much could this splendour of lake-vegetation be augmented if the reginal Victoria, the prodigious waterlily of the Amazon River, was scattered and naturalised in these lakes, to expand over their surface its stupendous leaves, and to send forth its huge snowy and crimson fragrant flowers. It would add to the aliment which the natives now obtain from these lakes and swamps by diving for the roots and fruits of the *Nymphææ*, or for the tubers of *Heleocharis sphacelata*, of species of *Aponogeton*, or by uprooting the starchy rhizomes of *Typha augustifolia* (the Bullrush), when eager of adding a vegetable component to their diet of Unio shells, or of water-fowls and fishes, all abounding on these favourite places of their resort. *Trapa bispinosa*, already living, like the Victoria, in the tanks of our conservatories, ought, with *Trapa natans*, for the sake of its nuts not only to be naturalised in the waters of the north, but also in the lagoons and swamps of the south. Around these lakes Screwpines *(Pandanus spiralis* and *Pandanus aquaticus)* may often be seen to emerge from the banks, the latter, as recorded already by Leichhardt, always indicative of permanent water. The young top-parts of the stems of these *Pandans*, when subjected to boiling, become free of acridity, and thus available in cases of emergency for food. *Opilia amentacea* and the weeping *Eugenia eucalyptoides*, together with a native cucumber *(Cucumis jucunda)*, are here among the few plants yielding edible fruit. Purslane *(Portulaca oleracea)* abounds, and in sandy soil it is found pleasantly acidulous. It will always be acceptable, as a salad or spinage, especially in affections from scurvy, and its amylaceous seeds might in cases of distress be readily gathered for food. A delicious tall perennial spinage *(Chenopodium auricomum)* is not unfrequent. Beyond one kind of *Sandarach Callitris* no pines exist in the north, except the *Araucaria Greyi*, noticed on a circumscribed spot on the Glenelg River. The true bamboo *(Bambusa arundinacea)* lines, as far as yet observed, only the banks of a few of the rivers of Arnhems-land.

To the pastoral settler, for whom more particularly the generally open *Eucalyptus* country or the treeless or partly scrubby tracts are eligible, it must be of significance that the rainfall occurs with frequency during the hottest part of the year. Hence, during the summer, grass and herbage is pushing forth with extraordinary rapidity and exuberance, while a judicious burning at the cooler season, together with the effect of regular dews, is certain to produce fresh forage during the drier months. An almost endless variety of perennial nutritious grasses, allied to Indian species, or even identical with them, are known to exist. The basaltic downs of the north and north-west produce almost precisely that same vegetation which has rendered Darling and Peak Downs so famed in the east. This almost absolute identity of plants is a sufficient indication of great semblance of climate, for which the rise of the country, though one not very considerable, to some extent may account. On the ranges which divide the waters of the east-coast from those of Carpentaria, the vine luxuriates; its fruit indeed suffers occasionally from frost.

How far the tracts south of the more littoral northern country may

continue to bear prevailingly the feature of fertility cannot be predicated. There can be no greater fallacy than to prejudge an untraversed country—a fallacy to which explorers are prone, and which, in some instances, has retarded advancement of geographical discoveries and of new locations of permanent abodes, while, in other instances, it has led to disastrous consequences. A country should be judged with caution. Even from elevations comparatively inconsiderable, as such nearly always proved away from the eastern coast, the orb of vision is limited. A traveller may, buoyant with hope, commence his new daily conquest on the delightful natural lawns or the verdant slopes of a trap formation; and before many hours' ride he may, to his dismay, be brought without water to a bivouac between the sand waves of decomposed barren rocks. But as suddenly a few hours' perseverance may bring him again into geological regions of fertility when he least expected it; smiling landscapes may again burst into his view, and he may establish his next camp on limpid water, sufficient for the requirements of a future city. The nature of a country is not ruled by climate and latitude alone, but quite as much, if not more, by its geological structure. Glancing on the map of an unexplored country, we are apt to take in our conjectures the former alone for a guide, until the latter by actual field-operations becomes our stronghold in topographical mapping. It would thus be unsafe to assume that the great western half of the interior consists mainly of desolate, uninhabitable desert-country, or even to contend that the reappearance on Termination Lake, or on the Murchison River, of so very many of the plants which give to the saltbush country, or the Mallee and Brigalow scrubs, on the extensive depression of the Darling-system, their physiognomy, necessitates their uninterrupted extension from the rear of Arnhems-land to the Murray Desert, or to Shark Bay. From demonstrating facts like these we dare no more infer but that likely many similar tracts of flat country are stretching over portions of the wide intervening spaces. But who will predict more? May not the large system of salt-lakes formed by the drainage of rain into cavities of saline flats be found limited to the less distant portions of the interior of Western Australia, and may it not thus, by a gradual rise of the ground (evidently manifest northerly), give place to a system of fresh-water lakes or lagoons, or even of such springs as rewarded the exertions of the keenly searching explorers west of Lake Eyre? And although it must be admitted that no ranges simultaneously lofty and wooded, and thus originating springs and rivulets for the formation of larger rivers, are likely to exist to any extent in the extra-tropical part of the western interior, because such rivers have not found their way to the coast; yet it is still possible, and rather probable, that mountains as high, and much less bare than Gawler Range, and even much more extensive, may give rise to interior watercourses, along which the dwellings of new colonists may be established, and to which our pasture-animals may flock, but which in their sluggish progress cannot force their way to the ocean, and are thus lost in numerous more or less ample inland basins. Years hence, on even less favoured spots, artesian borings may afford the means of stay for a dense population, should, as may be anticipated, mineral riches prove to be scattered not merely over the vicinity of the west-coast and Spencer's Gulf, but also over interjacent areas of geological similarity. York's Peninsula, close to settlements,

was long left an uninhabited and desolate spot, until its richdom of copper-ore was disclosed. So other unmapped parts of Australia are also likely to prove rich; and, although equal facilities for the transit of the mineral treasures would not always exist, its discovery would be certain to lead to the occupation of the country and to the extension of pastoral colonisation, until an increasing population and augmented conveniences for traffic could turn mineral wealth, however distantly located, advantageously to account. But how vastly might not any barren tracts of the interior be improved, and how many a lordly possession be founded, by patient industry and intelligent judgment! Storage of water, raising of woods, dissemination of perennial fodder-plants, will create alone marvellous changes; and for these operations means are readily enough at command. Even the scattering of the grains of the common British *orache (Atriplex patulum)*, an annual but autumnal plant, would, on the barest ground, realise fodder for sheep; and the number of plants which for such purpose could be chosen are legion. The storage of rainwater might in any rising valley be so effected as to render it, simply by gravitation, available for irrigating purposes.

As a curious fact, it may be instanced that in some of the waterless sandy regions of South Africa the copious naturalisation of melon-plants has afforded the means of establishing halting places in a desert country. On the sandy shores of the Great Bight, and also anywhere in the dry interior, such plants might be easily established. The avidity with which the natives at Escape Cliffs preserved the melon-seeds, after they once had recognised the value of their new treasure, holds out the prospect of the gradual diffusion of such vegetable boons over much unsettled country.

No part of Australia has the marked peculiarities of its vegetation so strongly expressed, and no part of this great country produces so rich an assemblage of species within a limited area, as the remotest south-western portion of the continent. Indeed, the southern extremity of Africa is the only part of the globe in which an equally varied display of vegetable forms is found within equally narrow precincts, and endowed also with an equal richness of endemic genera. It is beyond the scope of this brief treatise to enter fully into a detailed exposition of the constituents of the south-western flora. It may mainly suffice to view such of the vegetable products as are drawn already into industrial use, or are likely to be of avail for the purpose. Foremost in this respect stands perhaps the mahogany-eucalypt *(Eucalyptus marginata)*. The timber of this tree exhibits the wonderful quality of being absolutely impervious to the inroads of the limnoria, the teredo, and chelura, those minute marine creatures so destructive to wharves, jetties, and any work of naval architecture exposed to the water of the sea; it equally resists the attacks of termites. In these properties the red gumtree of our own country largely shares. The mahogany-eucalypt has, in the Botanic Gardens of this city, been brought for the first time largely under cultivation, and as clearly the natural supply of this important timber will sooner or later prove inadequate to the demanded requirements, it must be regarded as a wise measure of the Governments of France and Italy now to establish this tree on the Mediterranean shores, a measure for which still greater facilities are here locally afforded.

The tuart *(Eucalyptus gomphocephala)* is another of the famed artisan's woods of south-western Australia. The karri eucalypt *(Eucalyptus*

colossea or *diversicolor)* attains in favourable spots a height of 400 feet. *Eucalyptus megacarpa* constitutes the blue gumtree, which rivals that of Tasmania and Victoria in size, but is otherwise very distinct. Its timber, as well as that of the tuart, on account of their hardness, are employed for tramways and other works of durability. The fragrant wood of several species of santalum forms an article of commercial export. Some kinds of Casuarina, quite peculiar to that part of Australia, furnish superior wood for shingles and for a variety of implements. Several species of Acacia, especially *Acacia acuminata*, the raspberry-scented Wattle, equally restricted to the south-west coast, yield fragrant and remarkably solid wood and a pure gum. To this part of Australia was naturally also restricted the *Acacia lophantha*, which has for the sake of its easy and rapid growth and its umbrageous foliage assumed such importance even beyond Australia for temporary shelter-plantations. Many other products, such as gum-resins, sandarach, tanner's bark, all of great excellence, are largely available; but these substances show considerable similarity to those obtained in other Australian colonies.

The extraordinary abundance, however, of the Xanthorrhœas through most parts of the south-west territory gives special interest to the fact (1845) promulgated by Stenhouse, that anthrazotic, or nitro-picric acid—a costly dye—may, with great ease and little cost, be prepared from the resin of these plants. Indeed, this is the richest source for this acid, the resin yielding half its weight in dye. Fibre of great excellence and strength is obtained from the bark of *Pimelea clavata*, a bush widely distributed there. It resembles that of bast from *Pimelea axiflora* in Gippsland, and that from *Pimelea microcephala* of the Murray and Darling desert. A fern-palm *(Zamia Fraseri)* attains in West Australia a height of fifteen feet. It is there, like some congeners of America and South-Africa, occasionally sacrificed for the manufacture of a peculiar starch, though the export of the stems (and perhaps of those of the xanthorrhœas also) would prove much more profitable, inasmuch as these, when deprived of their noble crown of leaves, though not of their roots, will endure a passage of many months, even should the plants be half a century old. Such any wool-vessel might commodiously take to Europe. This alimentary fern-palm, well appreciated by the aborigines for the sake of its nuts, together with a true kind of yam *(Dioscorea hastifolia)*, the only plant on which the natives in their pristine state anywhere in Australia bestowed a crude cultivation, are, with species of *Borya, Sowerbæa, Hæmodorum, Ricinocarpus, Macarthuria, Chloanthes, Aphanopetalum, Xylomelum, Caleana, Calectasia, Petrophila, Leschenaultia, Pseudanthus, Nematolepis, Nuytsia* (the terrestrial mistletoe), *Leucolæna, Commersonia, Rulingia, Keraudrenia, Mirbelia, Gastrolobium, Labichea, Melichrus, Monotaxis, Actinotus,* and *Stypandra*, remarkable for their geographical distribution; because as far as we are hitherto aware, these West Australian genera have no representatives in the wide interjacent space until we approach towards the eastern, or in a few instances to the northern regions of Australia, *Zamia* alone having been noticed in South Australia *(Zamia Macdonnellii)*, but there as an exceedingly local plant. Neither climatic nor geologic considerations explain this curious fact of phytogeography. Over some of the heathy tracts of scrub-country towards the south-west coast, poisonous species of *Gastrolobium (Gastrol. bilobum, G. oxylobioides, G. calycinum, G.*

callistachys) are dispersed. These plants have in some localities rendered the occupation of country for pastoral pursuits impossible, but these poison-plants are mostly confined to barren spots, and it is not unlikely that by repeated burnings, and by the raising of perennial fodder-plants, they could be suppressed and finally extirpated. Fortunately, in no other parts of Australia *Gastrolobium* occurs, except on the inland tract from Attack Creek to the Suttor River, where flocks must be guarded against access to the scrub-patches harbouring the only tropical species *(Gastrolobium grandiflorum)*. The deadly effect occasionally produced by *Lotus Australis*, a herb with us of very wide distribution, and extending also to New Caledonia, and the cerebral derangements manifested by pasture animals which feed on the Darling River pea *(Swainsona Greyana)*, need yet extensive investigation, but may find their explanation in the fact that the organic poisonous principle is only locally, under conditions yet obscure, developed; or in the probable circumstance that, like in a few other leguminous plants, the deleterious properties are strongly concentrated in the seed. The gorgeous desert-pea *(Clianthus Dampierii)*, which in its capricious distribution has been traced sparingly from the Lachlan River to the north-west coast, offers still to seed-collectors a lucrative gain.

A prominent aspect in the vegetation of south-west Australia emanates from the comparatively large number of singularly beautiful *Banksia*-trees, preponderant there as the arborous *Grevilleæ* in North Australia. The existence of but two of that genus, *Banksia Australis* and *B. ornata*, in the extensive tract of interior and coast land from the head of the Australian Bight to the vicinity of Port Phillip, renders the occurrence of an increased number of trees of this kind in East Australia again still more odd. Rutaceous and goodeniaceous plants, though in no part of the Australian continent rare, attain in the south-west their greatest numerical development, and should not be passed silently, or, like *Epacrideæ*, as merely ornamental plants, though still so rare in our gardens; but these elegant plants deserve also attention for their diaphoretic properties, or for the bitter tonic principle which pervades nearly all the species of the two orders. *Stylideæ* are here still more numerous than in our north, and comprise forms of great neatness; while sundews *(Droseræ)* are also found to be more frequent than in any other part of Australia, and indeed of the globe. When, glittering in their adamantine dew, they reappear as the harbingers of spring from year to year, they are greeted always anew with admiration. But the greatest charm of the vegetation consists in the hundreds of myrtaceous bushes peculiar to the west, all full of aromatic oil; among these again the feather-flowered numerous *Verticordiæ*, the crimson *Calothamni*, and the heathy *Calythrices*, vie with each other as ornaments. Still also of this order many gorgeous plants exist in other parts of, especially extra-tropical, Australia. The numerous bushes of *Leguminosæ* and *Proteaceæ* in south-west Australia are also charming. The introduction of all these into European conservatories might be made the object of profitable employment. Annual herbs of extreme minuteness, belonging chiefly to *Compositæ*, *Umbelliferæ*, *Stylideæ*, and *Centrolepideæ*, are here, as in other parts of extra-tropical Australia, in their aggregate more numerous than minute phanerogamic plants in any other part of the globe. A line of demarcation for including the main mass of the south-west Australian vegetation may almost be drawn from the Murchison River or Shark Bay to the western extremity

of the Great Bight; because to these points penetrates the usual interior-vegetation, which thence ranges to Sturt's Creek, to the Burdekin, Darling, and Murray River, while the special south-west Australian flora ceases to exist as a whole beyond the limits indicated.

The marine flora of south-west Australia is likewise eminently prolific in specific forms, perhaps more so than that of any other shore. Many of the algæ are endemic, others extend along the whole southern coast and Tasmania, where again a host of species proved peculiar; some are also extra-Australian. The whole eastern coast contrarily, and also the northern and the north-western, with the exception of a few isolated spots, such as Albany Island, contrast with the southern coast as singularly poor in algæ. In a work exclusively devoted to the elucidation of the marine plants of Australia—a work which as an ornament of phytographic literature stands unsurpassed, and which necessitated lengthened laborious researches of its illustrious author, the late Professor Harvey, here on the spot—the specific limits of not less than 800 algæ are fixed. Some of these are not without their particular uses. A few yield caragaheen, all bromine and iodine. *Macrocystis pyrifera*, the great kelp, which may be seen floating in large masses outside Port Phillip Heads, attains the almost incredible length of many hundred feet, while a single plant of the leathery broad *Urvillea potatorum* constitutes a heavy load for a pack-horse.

The wide depressed interior, once supposed to be an untraversable desert, consists, as far as hitherto ascertained, much less of sandy ridges than of sub-saline or grassy flats, largely interspersed with tracts of scrub, and occasionally broken by comparatively timberless ranges. The great genus *Acacia*, which gives to Australia alone about 300 species (and, therefore, specific forms twice as numerous as that of any other Australian generic type), sends its shrubs and trees also in masses over this part of the country, where with their harsh and hard foliage they are well capable to resist the effect of the high temperature during the season of aridity, while they are equally contented with the low degree of warmth to which, during nights of the cool season, the dry atmosphere becomes reduced. Handsome bushes of *Eremophila*, with blossoms of manifold hue, decorate the scrubs throughout the whole explored interior. Among the desert *Cassiæ* two simple-leaved kinds are remarkable. Of the *Acaciæ* none here, except *A. Farnesiana*, have pinnated leaves, and even one is leafless; the pinnated *Acaciæ* being restricted to the more littoral tracts, and even there from the Great Bight to Guichen Bay entirely absent. If shelter plantations of the rapidly-growing eucalypts, acacias, and casuarinas were raised, a vast variety of useful plants could be reared along the watercourses of the more central parts of Australia. Saltbushes in great variety stretch far inland, and this is the forage on which flocks so admirably thrive. Probably the extensive Asiatic steppes have to boast of no greater diversity of salsolaceous plants than our own. Nevertheless, even here much could be added to the productiveness of these pasturages by the introduction of other perennial fodder herbs. Grasses, wherever they occur, are varied, and a large share is perennial, nutritious, and widely diffused. As corroborative, it may be instanced that *Anthistiria ciliata*, the common kangaroo-grass, almost universally ranges over Australia, and thus also over the central steppes o the continent. It extends, indeed, to Asia and North Africa also. Besides, through the interior, grasses, especially of *Panicum* and *Andropogon*, are

numerous, either on the oases or interspersed with the shrubs on barren spots. *Festuca* or *Triodia irritans*, the porcupine-grass of the settlers, is restricted to the sands of the extra-tropical latitudes; *Festuca* or *Triodia viscida*, chiefly to the sandstone table-lands of the tropics.

Only in the south-eastern parts of the continent and in Tasmania are the mountains rising to alpine elevations. Mount Hotham, in Victoria, and Mount Kosciusko, in New South Wales, form the culminating points, each slightly exceeding 7000 feet in height. In the ravines of these summits lodge perennial glaciers; at 6000 feet snow remains unmelted for nearly the whole of the year, and snowstorms may occur in these elevations during the midst of summer. At 5000 feet the vegetation of shrubs generally commences, and up to this height ascend two eucalypts, *Eucalyptus coriacea* and *Gunnii*, forming dense and extensive thickets; *E. coriacea* assuming, however, in lower valleys, huge dimensions. Both these, with most of our alpine plants, would deserve transplanting to middle Europe and to other countries of the temperate zone, where they would well cope with the vicissitudes of the climate. In Tasmania the winter snowline sinks considerably lower, and in its moister clime many alpine plants descend there along the torrents and rivulets to the base of the mountains which here are constantly clinging to cold elevations. Mount William is the only subalpine height isolated in Victoria from the great complex of snowy mountains, but it produces, beyond *Eucalyptus alpina* and *Pultenæa rosea*, which are confined to the crest of that royal mountain, only *Celmisia longifolia* and little else as the mark of an alpine or rather subalpine flora. *Celmisia* also is one of the few representatives of cold heights in the Blue Mountains; and from New England we know only *Scleranthus biflorus*, a cushion-like plant, exquisitely adapted for margining garden plots, and *Gaultheria hispida*, as generally indicating spots on which snow lodges for some of the winter months. The mountains of Queensland would need in their tropical latitudes a greater height than they possess for nourishing analogous forms of life, but the truly alpine vegetation of the high mountains of Tasmania contrasts in some important respects with that of the Australian Alps—namely, therein, that under the prevalence of a much higher degree of humidity plants which delight to be bathed in clouds, or in the dense vapours of the surrounding fern-tree valleys, are much more universal; and that the number of peculiar alpine *genera* is much greater than here. Thus, while in Tasmania the magnificent evergreen beach (*Fagus Cunninghami*) covers many of the ranges up to sub-alpine rises, it predominates as a forest tree in Victoria only at the remotest sources of the Yarra, the Latrobe, and the Goulburn rivers, and on Mount Baw-Baw. To this outpost of the Australian Alps (now so accessible to metropolitan tourists) are restricted also several plants, such as *Oxalis Magellanica* and *Libertia Lawrencii*, which are almost universal on all the higher hills of Tasmania. *Fagus Cunninghami*, though descending into our ferntree-ravines, transgresses nowhere the Victorian land-boundaries, but a noble fagus-forest, constituted by a distinct and equally evergreen species, *Fagus Moorei*, crowns the high ranges on which the Bellinger and M'Leay rivers rise. This, however, the snowy mountains of Tasmania and of continental Australia have in common, that the majority of the alpine plants are not representing genera peculiar to colder countries, but exhibit hardy forms, referable to endemic Australian genera, or such as are allied to them. So, as already remarked, we possess alpine species, even of *eucalyptus* and of *acacia*,

besides of *hibbertia*, *oxylobium*, *bossiæa*, *pultenæa*, *eriostemon*, *boronia* *didiscus*, *epacris*, *leucopogon*, *prostanthera*, *grevillea*, *hakea*, *persoonia*, *pimelea*, *kunzea*, *baeckea*, *stackhousia*, *mitrasacme*, *xanthosia*, *coprosma*, *velleya*, *prasophyllum*; yet *anemone*, *caltha*, *antennaria*, *gaultheria*, *alchemilla*, *seseli*, *oenothera*, *huanaca*, *abrotanella*, *ligusticum*, *astelia*, *gunnera*, and other northern or western types, are not altogether missing, though nowhere else to be found in Australia but in glacier regions.

About half a hundred of the highland plants are strictly peculiar to Victoria, the rest prove mainly identical with Tasmanian species; but a few of ours, not growing in the smaller sister land, are, strange as it may appear, absolutely conspecific with European forms. Rather more than one hundred of the lowland-plants ascend, however, to the glacial regions; some of these are simultaneously desert-species.

The only genus of plants absolutely peculiar to the Victorian territory, *Wittsteinia*, occurs as a dwarf sub-alpine plant, of more herbaceous than woody growth, restricted to the summits of Mount Baw-Baw; this, moreover, remained hitherto the only representative of *vaccinieæ* in all Australia; it produces, like most of the order, edible berries.

The verdant summer herbage of valleys, which snow covers during the winter months, will render with increasing value of land-estates these free, airy, and still retreats in time fully occupied as pasturage during the warmer part of the year. Here, in sheltered glens, we have the means of raising all the plants delighting in the coolest clime. Rye-culture could probably be carried on at considerable elevation.

Of all the phanerogamic plants of Tasmania, about 130 are endemic; of those about 80 are limited to alpine elevations, or descend from thence only into cool umbrageous valleys. The generic types peculiar to the island are again almost all alpine (*milligania*, *campynema*, *hewardia*, *pterygopappus*, *tetracarpæa*, *anodopetalum*, *cystanthe*, *prionotis*, *microcachrys*, *diselma*, *athrotaxis*, *pherosphæra*, *bellendena*, *cenarrhenes*, *archeria*), only *ocradenia* and *agastachys* belonging seemingly to the lowlands, but show at once a fondness for a wet, insular clime. The few Tasmanian genera, represented besides only in Victoria, are *richea*, *diplarrhena*, *drymophila*, *juncella*. In the Tasmanian highlands-flora endemic shrubby asters and *epacrideæ*, and the singular endemic pines of various genera, constitute a marked feature. A closer and more extended inquiry into the geological relation of great assemblages of vegetation will shed probably more light on the enigmatic laws by which the dispersion of plants is ruled. Australian forms predominate also in Tasmania at snowy heights, so *Eucalyptus gunnii*, *E. coccifera*, and *E. urnigera*. The famous Huon-pine (*Dacrydium Franklini*), the Palmheath (*Richea pandanifolia*), the celery-topped pine (*Phyllocladus rhomboidalis*), and the deciduous beech (*Fagus Gunnii*), are among the most striking objects of its insular vegetation. Mosses, lichenastra, lichens, and conspicuous fungs abound both in alpine and low regions; indeed, cryptogamic plants, except *Algs* and microscopic fungs, are nowhere in Australia really frequent except in Tasmania, in the Australian Alps, and in the ferntree-glens of Victoria and part of New South Wales. The musktree (*Aster argophyllus*) of Tasmania and South-east Australia is the largest of the few trees produced by the vast order of *Compositæ* in any part of the globe, while *Prostanthera lasianthos*, its companion, exhibits the only real tree known in the extensive family of *Labiatæ*. The almost exclusive

occupation of vast littoral tracts of Gippsland, and some of the adjoining islands, by the dwarf *Xanthorrhœa minor*, is remarkable. Mistletoes do not extend to Tasmania, though over every other part of Australia; neither the Nardoo (*Marsilea quadrifolia*), of melancholic celebrity, though to be found in every part of the continent, and abounding in innumerable varieties throughout the depressed parts of the interior. Equisetaceæ occur nowhere. The total of the species to be admitted as well defined, and hitherto known, from all parts of Australia, approaches (with exclusion of microscopic fungi) to 10,000.

It has been deemed of sufficient importance to append to this brief memoir an index of all the trees hitherto discovered in any part of Australia. Such statistics lead to reflection and comparison. They also bring more prominently before the contemplative mind the real access which in any branch of special knowledge may have been obtained. In this instance it is the only table with which this document has been burdened, though kindred lists might have readily been elaborated. Nor would this imperfect sketch of Australian vegetation have been extended to any detailed enumerations whatever, did not the *trees impress on the vegetation of each country its most distinctive feature*, and had we not learned how great a treasure each land possesses in its timber—whether as raw product to artisans or as objects of therapeutic application, whether as material for the products of manifold factories or as the source of educts in the chemical laboratory, whether as the means of affording employment to the workman or even as the medium for regulating the climate. May we revert only to the circumstance as elucidating the great physiographic characters of countries and their mutual relation, that notwithstanding the close proximity of New Zealand, *none* of its trees (though very many of its herbs) are positively identical with any observed in Australia; and yet hundreds of ours can in no way be distinguished from Indian trees. Moreover, in a philosophical contemplation of the nature of any country and the history of its creation, our attention is likely to be in the first instance engaged in a survey of the constituents of its pristine forests, and greatly is i to be feared that in ages hence, when much of the woods will have sunk under ruthless axes, the deductions of advanced knowledge thereon will have to be based solely on evidence early placed on record.

The marvellous height of some of the Australian, and especially Victorian trees, has become the subject of closer investigation, since of late, particularly through the miners' tracks, easier access has been afforded to the back-gullies of our mountain-system. Some astounding *data*, supported by *actual* measurements, are now on record. The highest tree previously known was a *Karri-Eucalyptus* (*Eucalyptus colossea*), measured by Mr. Pemberton Walcott, in one of the delightful glens of the Warren River of Western Australia, where it rises to approximately 400 feet high. Into the hollow trunk of this Karri three riders, with an additional packhorse, could enter and turn in it without dismounting. On the desire of the writer of these pages, Mr. D. Boyle measured a fallen tree of *Eucalyptus amygdalina*, in the deep recesses of Dandenong, and obtained for it the length of 420 feet, with proportions of width, indicated in a design of a monumental structure placed in the Exhibition; while Mr. G. Klein took the measurement of a eucalyptus on the Black Spur, ten miles distant from Healesville, 480 feet high! Mr. E. B. Heyne obtained at Dandenong as measurements of height of a tree of *Eucalyptus amygdalina*: Length of stem from the

base to the first branch, 295 feet; diameter of the stem at the first branch, 4 feet; length of stem from first branch to where its top portion was broken off, 70 feet; diameter of the stem where broken off, 3 feet; total length of stem up to place of fracture, 365 feet; girth of stem three feet from the surface, 41 feet. A still thicker tree measured, three feet from the base, 53 feet in circumference. Mr. George W. Robinson ascertained in the back-ranges of Berwick the circumference of a tree of *Eucalyptus amygdalina* to be 81 feet at a distance of four feet from the ground, and supposes this eucalypt, towards the sources of the Yarra and Latrobe rivers, to attain a height of half a thousand feet. The same gentleman found *Fagus Cunninghami* to gain a height of 200 feet and a circumference of 23 feet.

It is not at all likely that in these isolated inquiries chance has led to the really highest trees, which the most secluded and the least accessible spots may still conceal. It seems, however, almost beyond dispute that the trees of Australia rival in length, though evidently not in thickness, even the renowned forest-giants of California, *Sequoia Wellingtonia*, the highest of which, as far as the writer is aware, rise in their favourite haunts at the Sierra Nevada to about 450 feet. Still, one of the mammoth-trees measured, it is said, at an estimated height of 300 feet, 18 feet in diameter! Thus to Victorian trees for elevation the palm must apparently be conceded. A standard of comparison we possess in the spire of the Münster of Strassburg, the highest of any cathedral of the globe, which sends its lofty pinnacle to the height of 466 feet, or in the great pyramid of Cheops, 480 feet high, which if raised in our ranges would be overshadowed probably by eucalyptus trees.

The enormous height attained by not isolated, but vast masses of our timber-trees in the rich diluvial deposits of sheltered depressions within Victorian ranges, finds its principal explanation, perhaps, in the circumstance that the richness of the soil is combined with a humid geniality of the climate, never sinking to the colder temperature of Tasmania, nor rising to a warmth less favourable to the strong development of these trees in New South Wales, nor ever reduced to that comparative dryness of air which even to some extent in the mountain-ravines of South Australia is experienced. The absence of living gigantic forms of animal life amidst these the hugest forms of the vegetable world is all the more striking.

Statistics of actual measurement of trees compiled in various parts of the globe would be replete with deep interest, not merely to science, but disclose also in copious instances magnitudes of resources but little understood up to the present day. Not merely, however, in their stupendous altitude, but also in their celerity of growth, we have in all probability to accede to Australian trees the prize. Extensive comparisons instituted in the Botanic Gardens of this metropolis prove several species of eucalyptus, more particularly *Eucalyptus globulus* and *Eucalyptus obliqua*, as well as certain acacias—for instance, *Acacia decurrens*, or *Acacia mollissima*—far excelling in their ratio of development any extra-Australian trees even on dry and exposed spots, such into which spontaneously our blue gumtrees would not penetrate. This marvellous quickness of growth, combined with a perfect fitness to resist drought, has rendered many of our trees famed abroad, especially so in countries where the supply of fuel or of hardwoods is not readily attainable, or where for raising shelter, like around the cinchona-plantations of India, the early and copious command of tall

vegetation is of imperative importance. To us here this ought to be a subject of manifold significance. I scarcely need refer to the fact that for numerous unemployed the gathering of Eucalyptus seeds, of which a pound weight suffices to raise many thousand trees, might be a source of lucrative and extensive employment; but on this I wish to dwell, that in Australian vegetation we probably possess the means of obliterating the rainless zones of the globe, to spread at last woods over our deserts, and thereby to mitigate the distressing drought, and to annihilate perhaps even that occasionally excessive dry heat evolved by the sun's rays from the naked ground throughout extensive regions of the interior, and wafted with the current of air to the east and south, miseries from which the prevalence of sea-breezes renders the more littoral tracts of West and North Australia almost free. But in the economy of nature the trees, beyond affording shade and shelter, and retaining humidity to the soil, serve other great purposes. Trees, ever active in sending their roots to the depth, draw unceasingly from below the surface-strata those mineral elements of vegetable nutrition on which the life of plants absolutely depends, and which with every dropping leaf is left as a storage of aliment for the subsequent vegetation. How much lasting good could not be effected, then, by mere scattering of seeds of our drought-resisting acacias and eucalypts and casuarinas at the termination of the hot season along any watercourse, or even along the crevices of rocks, or over bare sands or hard clays, after refreshing showers? Even the rugged escarpments of the desolate ranges of Tunis, Algiers, and Morocco, might become wooded: even the Sahara itself, if it could not be conquered and rendered habitable, might have the extent of its oases vastly augmented; fertility might be secured again to the Holy Land, and rain to the Asiatic plateau or the desert of Atacama, or timber and fuel be furnished to Natal and La Plata. An experiment instituted on a bare ridge near our metropolis demonstrates what may be done.

Not Australia alone, but some other countries, have judiciously taken advantage of the facilities afforded by Australian tree-vegetation for raising woods, an object which throughout the interior might be initiated by rendering this an additional purpose of the expeditions to be maintained in the field for territorial and physiographical exploration; and more, it might deserve the reflection of the Legislature, which allots to the pastoral tenants their expansive tracts of country, whether or not along with squatting pursuits—indeed, for the actual benefit of the pastoral occupant himself—the inexpensive first steps for general forest-culture in the woodless regions should be commenced.

Within the ranges which produce these colossal trees but few habitations exist; indeed, we might traverse a line of a thousand miles as yet without a dwelling. The clime is salubrious; within the sheltered glens it cannot in excellence be surpassed. Hot winds, from which our exposed plains, as well as any rises of northern and western aspect, so much suffer, never reach the still and mild vales of the forests; frosts are only experienced in the higher regions. Speaking of Victoria especially, it is safe to assert that there alone many thousand square miles of mountainous country, timbered with stringybark-trees *(Eucalyptus obliqua)*, are as yet lying dormant for any other but isolated mining operations. And yet, might not families which desire to strike out a path of independent prosperity, which seek a simple patriarchal life in a salubrious locality of seclusion, and which command the needful strength

of labour within their own circle, choose these happy glens as their permanent abodes? Though the timbered rises of the ranges may be as yet unlucrative for cultivation, or even be sterile, the valleys are generally rich, irrigated by clear brooks, and spacious enough for isolated homes, and the limited number of pasture animals pertaining to them. The costlier products of culture might be realised, especially so in the fern-tree-glens; tea, and possibly cinchona, and coffee also; so lucrative fibres, dye plants of easy growth and simple preparation, as instanced by grass-cloth, or madder; or medicinal plants, such as senna, and various herbs, or, perhaps, even the *Erythroxylon coca*, a plant of almost fabulous properties. Or should the settler prefer, beyond raising the simple requirements for his rural life, to devote his attention solely to the gain which the surrounding timber treasures are certain to offer, he will find ample scope for his energy and industry. The Eucalypts, as now proved by extensive and accurate experiments, will yield him tar in abundance; they will furnish fibres, even those of stringybark, as one of the cheapest and most extensively available paper material. By a few simple appliances he may secure, simultaneously with the tar, also wood-vinegar and wood-spirit; and these again might locally be at once converted into dye materials and varnishes. He might obtain potash from woods, and volatile oils from the leaves of Eucalypts in almost any quantity, by artless processes, and with scarcely any cost. He might gather the gum-resins and barks for either medicinal or tanning purposes, or he might effect a trade in fern-trees; he might shake the *Eucalyptus* grains out of their capsules, and might secure locally other mercantile substances far too numerous to be enumerated here. Whoever may choose these ranges as a permanent home, and may direct thoughtfully his attention to the future, will recognise that the mere scattering of the acorns of the cork-tree or the seeds of the red cedar over cleared and yet sheltered ground, or the planting of the vine and olive, will yield to his descendants sources of great riches.

In closing these concise and somewhat chaotic suggestions, which scarcely admit of methodical arrangement, unless by expansion into the chapters of a volume, we may—indulging in a train of thoughts—pass from special to general considerations.

Belgium, one of the most densely populated of all countries, and yet one of the most prosperous, nourished within an area less than one-half that of Tasmania a population three times exceeding that of all the Australian colonies; yet one-fifth of the Belgian territory consists of forests. Not to any considerable extent smaller than Europe, our continent is likely to support in ages hence a greater population; because, while here no frigid zone excludes any portion of the territory from productiveness, or reduces it anywhere to very circumscribed limits, it embraces a wide tropical tract, destined to yield us products nowhere to be raised under the European sky. The comparatively unbroken uniformity of vast tracts of Australia certainly restricts us for the magnificent sceneries and the bracing air of the countries of our youth here to the hilly coast-tracts; but still we have not to endure the protracted colds of middle and north European winters, nor to contend with the climatic difficulties which beset tillage operations or pastoral pursuits, and which by patient perseverance could not be removed or be materially lessened.

While we are deprived of advantages so pleasing and so important as those of large river communications, we enjoy great facilities for land traffic, facilities to which every new discovery of coal-layers will add.

Judicious forest culture, appropriate to each zone, will vastly ameliorate the clime, and provide for the dense location of our race; for transplanting of almost every commodity both of the vegetable and animal empire, we possess, from the alp to the steppes, from the cool mountain-forests to the tropic jungles, conditions and ample space.

River-waters, now flowing unutilised to the ocean, when cast over the back plains, and artesian borings also, will effect marvellous changes. Steam power and the increased ingenuity of machinery applied to cultivation, will render the virgin soil extensively productive with far less toil than in older countries, while the teachings of science will guard us against the rapacious systems of culture and the waste of fertilisers which well nigh involved ruin to many a land. Of ferocious land animals, Australia is free. We have neither to encounter extensive hordes of savages to dispute the possession of the soil, nor the still more dangerous opposition of half-civilised barbarians, such as for ages yet may obstruct the progress of civilisation in the great interior of Africa.

Our continent, it may be foretold prophetically, will ere long be regarded of so high a territorial value that *no* tract, however much disregarded now, will remain unoccupied. Our continent, surrounded moreover by the natural boundaries of three oceans, free and unconnected, must advance, by extraneous influences undisturbed, by ancient usages unretarded, to that greatness to which British sovereignty will for ever give a firm stability.

THE TREES OF AUSTRALIA, PHYTOLOGICALLY NAMED AND ARRANGED, WITH INDICATIONS OF THEIR TERRITORIAL DISTRIBUTION.

No plants have been inserted in this list unless their height approached to 30 feet, although in a few instances they attain only exceptionally this standard. But *Cystanthe procera* and *Epacris heteronema* in the deep, swampy forest-recesses of South Port, and *Corræa Lawrenciana* in the dark ferntree ravines towards Cape Otway, rise to the adopted standard-height; whilst *Melaleuca squarrosa*, in the deep irriguous forest-glens at Sealer's Cove, has been noted 80 feet high, with a stem 40 feet long and two feet thick. It was preferable to admit these and a few other generally shrubby plants into this tree-list, were it only to render the luxuriance of the vegetation on these hardly ever traversed spots universally understood. The list comprises approximately 950 trees. Of these 88 occur in South-Western Australia, 63 in the territory of the colony of South Australia, 146 in that of Victoria, 66 in Tasmania, 385 in New South Wales, not less than 526 in Queensland, 212 in North Australia, and 29 in Central Australia. To the number of the Tasmanian and Victorian trees future observers will add but little. The list of those from Western Australia and South Australia is certain to receive additions by further discoveries in the interior, but probably the increase will not be extensive. About 25 trees from New South Wales known to exist could not be recorded, the

corresponding material in our museum admitting of no accurate examination. The cedar brushes, moreover, as well as the interior, are likely to yield still a limited number of hitherto unknown trees to future search. Queensland and North Australia are throughout the littoral and jungle tracts as yet imperfectly explored, and we yet expect to derive from these hundreds of additional trees, many of which doubtless will be of special interest and value both to the phytographer and the artisan. Central Australia, according to the narrower or wider limitation we may arbitrarily assign to it, is likely to furnish a considerable number of new trees, while others will be traced in that direction; but probably no new kinds of any great dimensions will be found. The construction of tabulated lists of trees indigenous to other parts of the globe would serve manifold useful comparisons; as yet none of those of Europe even are extant. It is contemplated to construct for all those trees which are not already provided with vernacular names free of ambiguity, and such as bear a logical meaning, new English appellations, as far as possible in consonance with the uses or the phytographic name of the tree.

[W.A. indicates West Australia; S.A., South Australia; T., Tasmania; V., Victoria; N.S.W., New South Wales; Q.L., Queensland; N.A., North Australia; C.A., Central Australia.]

DICOTYLEDONEÆ.

I.—Choripetaleæ.

DILLENIACEÆ.

Dillenia Andreana, F. M.... ...	—	—	—	—	—	Q.L.	—	—
Wormia alata, Br....	—	—	—	—	—	Q.L.	—	—

MAGNOLIACEÆ.

Drimys aromatica, F. M.... ...	—	—	T.	V.	—	—	—	—
„ dipetala, F. M.	—	—	—	—	N.S.W.	—	—	—
„ membranea, F. M.	—	—	—	—	—	Q.L.	—	—

ANONACEÆ.

Fitzgeraldia mitrastigma, F. M. ...	—	—	—	—	—	Q.L.	—	—
Polyalthia nitidissima, Benth. ...	—	—	—	—	—	Q.L.	—	—
Melodorum Leichhardtii, Benth....	—	—	—	—	NS.W.	Q.L.	—	—
Eupomatia laurina, Br.	—	—	—	V.	N.S.W.	Q.L.	—	—

MONIMIACEÆ.

Atherosperma moschatum, Lab....	—	—	T.	V.	N.S.W.	—	—	—
„ sassafras, J. Hook.	—	—	—	—	N.S.W.	—	—	—
„ micranthum, Tul.	—	—	—	—	N.S.W.	Q.L.	—	—
Mollinedia Wardellii, F. M. ...	—	—	—	—	—	Q.L.	—	—
Wilkiea calyptrocalyx, F. M. ...	—	—	—	—	N.S.W.	Q.L.	—	—
Hedycarya Cunninghami, Tul. ...	—	—	—	V.	N.S.W.	—	—	—

MYRISTICEÆ.

Myristica cimicifera, Br.	—	—	—	—	—	Q.L.	—	—
„ insipida, Br.	—	—	—	—	—	Q.L.	—	—

CAPPARIDEÆ.

Cadaba capparoides, Cand. ...	—	—	—	—	—	—	N.A.	—
Capparis sarmentosa, Cunn. ...	—	—	—	—	N.S.W.	Q.L.	—	—
Busbeckia nobilis, Endl.	—	—	—	—	N.S.W.	Q.L.	—	—
„ Mitchellii, F. M.	—	S.A.	—	V.	N.S.W.	Q.L.	N.A.	C.A.
Apophyllum anomalum, F. M. ...	—	—	—	—	N.S.W.	Q.L.	—	—

VIOLARINEÆ.								
Hymenanthera Banksii, F. M. ...	—	—	T.	V.	N.S.W.	Q.L.	—	—
POLYGALEÆ.								
Xanthophyllum Macintyrii, F. M.	—	—	—	—	—	Q.L.	—	—
COCHLOSPERMEÆ.								
Cochlospermum heteronemum, F. M.	—	—	—	—	—	—	N.A.	—
„ Gregorii, F. M.	—	—	—	—	—	Q.L.	N.A.	—
BIXACEÆ.								
Scolopia Brownii, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
Xylosma ovatum, Benth.	—	—	—	—	—	Q.L.	—	—
PITTOSPOREÆ.								
Pittosporum rhombifolium, Cunn.	—	—	—	—	N.S.W.	Q.L.	—	—
„ melanospermum, F. M. ...	—	—	—	—	—	Q.L.	N.A.	—
„ undulatum, Vent.	—	—	—	V.	N.S.W.	—	—	—
„ ovatifolium, F. M.	—	—	—	—	—	Q.L.	—	—
„ phillyroides, Cand.	W.A.	S.A.	—	V.	N.S.W.	Q.L.	N.A.	C.A.
„ bicolor, Hook.	—	—	T.	V.	N.S.W.	—	—	—
Hymenosporum flavum, F. M. ...	—	—	—	—	N.S.W.	Q.L.	—	—
Bursaria spinosa, Cav.	W.A.	S.A.	T.	V.	N.S.W.	Q.L.	N.A.	C.A.
GOMPHIACEÆ.								
Brackenridgea Australiana, F.M....	—	—	—	—	—	Q.L.	—	—
GUTTIFERÆ.								
Calophyllum inophyllum, L. ...	—	—	—	—	—	Q.L.	N.A.	—
ERYTHROXYLEÆ.								
Erythroxylon Australe, F. M. ...	—	—	—	—	—	Q.L.	—	—
SIMARUBEÆ.								
Ailantus punctata, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ imberbiflora, F. M.	—	—	—	—	—	Q.L.	—	—
Brucea Sumatrana, Roxb. ...	—	—	—	—	—	Q.L.	N.A.	—
Cadellia pentastylis, F. M. ...	—	—	—	—	N.S.W.	—	—	—
„ monostylis, Benth.	—	—	—	—	N.S.W.	—	—	—
MELIACEÆ.								
Sandoricum Indicum, L.	—	—	—	—	—	Q.L.	—	—
„ nervosum, Bl.	—	—	—	—	—	Q.L.	—	—
Melia Azedarach, L.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Dysoxylon oppositifolium, F. M....	—	—	—	—	—	Q.L.	—	—
„ latifolium, Benth.	—	—	—	—	—	Q.L.	—	—
„ Fraseri, Benth.	—	—	—	—	N.S.W.	—	—	—
„ Muelleri, Benth.	—	—	—	—	N.S.W.	Q.L.	—	—
„ Nernsti, F. M.	—	—	—	—	—	Q.L.	—	—
„ Lesserti, Benth.	—	—	—	—	N.S.W.	—	—	—
„ Klanderi, F. M.	—	—	—	—	—	Q.L.	—	—
„ rufum, Benth.	—	—	—	—	N.S.W.	Q.L.	—	—
Hearnia sapindina, F. M.... ...	—	—	—	—	—	Q.L.	—	—
Aglaia elæagnoides, Benth. ...	—	—	—	—	—	Q.L.	N.A.	—
Amoora nitidula, Benth.	—	—	—	—	N.S.W.	Q.L.	—	—
Synoon glandulosum, Juss. ...	—	—	—	—	N.S.W.	Q.L.	—	—
Owenia acidula, F. M.	—	—	—	—	—	Q.L.	—	—
„ vernicosa, F. M.	—	—	—	—	—	—	N.A.	—
„ venosa, F. M.	—	—	—	—	—	Q.L.	—	—
„ reticulata, F. M.	—	—	—	—	—	—	N.A.	—
Carapa Moluccensis, Lam. ...	—	—	—	—	—	Q.L.	N.A.	—
Cedrela Toona, Roxb.	—	—	—	—	N.S.W.	Q.L.	—	—

Flindersia Australis, Br.	—	—	—	—	—	Q.L.	—	—
„ Schottiana, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ Oxleyana, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ Bennettiana, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ Brayleana, F. M.	—	—	—	—	—	Q.L.	—	—
„ Strzeleckiana, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—

RUTACEÆ.

Correa Lawrenciana, Hook.	—	—	T.	V.	—	—	—	—
Boronia arborescens, F. M.	—	—	T.	V.	N.S.W.	Q.L.	—	—
Acradenia Frankliniæ, Kipp.	—	—	T.	—	—	—	—	—
Bosistoa sapindiformis, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
Pagetia medicinalis, F. M.	—	—	—	—	—	Q.L.	—	—
Euodia neurococca, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ erythrococca, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ octandra, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ Bonwickii, F. M.	—	—	—	—	—	Q.L.	—	—
„ haplophylla, F. M.	—	—	—	—	—	Q.L.	—	—
„ micrococca, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ xanthoxyloides, F. M.	—	—	—	—	—	Q.L.	—	—
„ Elleryana, F. M.	—	—	—	—	—	Q.L.	—	—
„ Cunninghami, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
Coatesia paniculata, F. M.	—	—	—	—	—	Q.L.	—	—
Geijera salicifolia, Schott	W.A.	S.A.	—	V.	N.S.W.	Q.L.	N.A.	C.A.
Xanthoxylon brachyacanthum, F. M.	—	—	—	—	—	Q.L.	—	—
„ Blackburnia, Benth.	—	—	—	—	N.S.W.	—	—	—
„ parviflorum, Benth.	—	—	—	—	—	—	N.A.	—
Acronychia Baueri, Schott	—	—	—	—	N.S.W.	Q.L.	—	—
„ laevis, Forst.	—	—	—	—	N.S.W.	Q.L.	—	—
„ imperforata, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ acidula, F. M.	—	—	—	—	—	Q.L.	—	—
„ vestita, F. M.	—	—	—	—	—	Q.L.	—	—
„ melicopoides, F. M.	—	—	—	—	—	Q.L.	—	—
Glycosmis pentaphylla, Corr.	—	—	—	—	—	Q.L.	—	—
Micromelum pubescens, Blume	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Murraya exotica, L.	—	—	—	—	—	Q.L.	—	—
„ crenulata, Oliv.	—	—	—	—	—	Q.L.	—	—
Citrus Planchonii, F. M.	—	—	—	—	—	Q.L.	—	—
„ Australasica, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—

MALVACEÆ.

Plagianthus sidoides, Hook.	—	—	T.	—	—	—	—	—
„ pulchellus, Gray	—	—	T.	V.	N.S.W.	—	—	—
„ Berthæ, F. M.	W.A.	—	—	—	—	—	—	—
Howittia trilocularis, F. M.	—	—	—	V.	N.S.W.	—	—	—
Hibiscus tiliaceus, L.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
„ Patersoni, Cand.	—	—	—	—	—	Q.L.	—	—
„ populneus, L.	—	—	—	—	—	Q.L.	N.A.	—
Adansonia Gregorii, F. M.	—	—	—	—	—	—	N.A.	—
Bombax Malabaricum, Cand.	—	—	—	—	—	—	N.A.	—

STERCULIACEÆ.

Sterculia fœtida, L.	—	—	—	—	—	—	N.A.	—
„ quadrifida, Br.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Brachychiton ramiflorum, Br.	—	—	—	—	—	—	N.A.	—
„ discolor, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ incanum, Br.	—	—	—	—	—	—	N.A.	—
„ luridum, Moore	—	—	—	—	N.S.W.	—	—	—
„ platanoides, Br.	—	—	—	—	—	Q.L.	N.A.	—
„ acerifolium, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ populneum, Br.	—	—	—	V.	N.S.W.	Q.L.	—	—
„ diversifolium, Br.	—	—	—	—	—	—	N.A.	—
„ Gregorii, F. M.	W.A.	—	—	—	—	—	—	—
„ Delabechei, F. M.	—	—	—	—	—	Q.L.	—	—

Tarrietia argyrodendron, Benth. ...	—	—	—	—	N.S.W.	Q.L.	—	—
L'Heritiera litoralis, Ait.	—	—	—	—	—	Q.L.	—	—
Helicteres isora, L....	—	—	—	—	—	—	N.A.	—
Abroma fastuosa, L.	—	—	—	—	—	Q.L.	—	—
Commersonia Fraseri, Gay ...	—	—	—	V.	N.S.W.	—	—	—
,, echinata, Forst.	—	—	—	—	N.S.W.	Q.L.	—	—
Seringea platyphylla, Gay... ...	—	—	—	—	N.S.W.	—	—	—

TILIACEÆ.

Berrya Ammonilla, Roxb.... ...	—	—	—	—	—	Q.L.	—	—
Grewia multiflora, Juss.	—	—	—	—	—	Q.L.	N.A.	—
,, latifolia, F. M.	—	—	—	—	—	Q.L.	—	—
Sloanea Australis, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Langii, F. M.	—	—	—	—	—	Q.L.	—	—
Elæocarpus foveolatus, F. M. ...	—	—	—	—	—	Q.L.	—	—
,, holopetalus, F. M.	—	—	—	V.	N.S.W.	—	—	—
,, obovatus, Don.	—	—	—	—	N.S.W.	Q.L.	—	—
,, cyaneus, Ait.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, Arnhemicus, F. M.	—	—	—	—	—	—	N.A.	—
,, grandis, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—

PHYTOLACCEÆ.

Codonocarpus cotinifolius, F. M....	W.A.	S.A.	—	V.	N.S.W.	—	—	C.A.
,, pyramidalis, F. M.	—	S.A.	—	—	—	—	—	—

AMARANTACEÆ.

Deeringia altissima, F. M. ...	—	—	—	—	N.S.W.	Q.L.	—	—

NYCTANGINEÆ.

Pisonia excelsa, Bl....	—	—	—	—	—	Q.L.	N.A.	—

OLACINEÆ.

Ximenia Americana, L.	—	—	—	—	—	Q.L.	—	—
Pennantia Cunninghami, Miers....	—	—	—	—	N.S.W.	—	—	—
Villaresia Moorei, F. M.	—	—	—	—	N.S.W.	—	—	—
,, Smythii, F. M.	—	—	—	—	—	Q.L.	—	—
Byronia Arnhemensis, F. M. ...	—	—	—	—	—	—	N.A.	—

ANACARDIACEÆ.

Rhus rhodanthemum, F. M. ...	—	—	—	—	N.S.W.	Q.L.	—	—
Buchanania augustifolia, Roxb....	—	—	—	—	—	Q.L.	N.A.	—
Euroschinus falcatus, J. Hook. ...	—	—	—	—	N.S.W.	Q.L.	—	—
Semecarpus Anacardium, L. ...	—	—	—	—	—	Q.L.	N.A.	—
Spondias Solandri, Benth.... ...	—	—	—	—	—	Q.L.	—	—
,, pleiogyna, F.M.	—	—	—	—	—	Q.L.	—	—

BURSERACEÆ.

Garuga floribunda, Decaisne ...	—	—	—	—	—	—	N.A.	—
Canarium Australianum, F. M....	—	—	—	—	—	Q.L.	N.A.	—

VINIFERÆ.

Vitis hypoglauca, F. M.	—	—	—	V.	N.S.W.	Q.L.	—	—
Leea sambucina, Willd.	—	—	—	—	—	Q.L.	N.A.	—

SAPINDACEÆ.

Diploglottis Cunninghami, J. Hook.	—	—	—	—	N.S.W.	Q.L.	—	—
Erioglossum edule, Blume. ...	—	—	—	—	—	—	N.A.	—
Schmidelia serrata, Cand.... ...	—	—	—	—	—	Q.L.	N.A.	—
Cupania punctulata, F. M... ...	—	—	—	—	—	Q.L.	—	—
,, anacardioides, Rich.... ...	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, Robertsonii, F. M.	—	—	—	—	—	Q.L.	N.A.	—
,, serrata, F. M...	—	—	—	—	N.S.W.	Q.L.	—	—

Cupania tomentella, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ Mortoniana, F. M.	—	—	—	—	—	Q.L.	—	—
„ Pseudo-Rhus, Rich.	—	—	—	—	N.S.W.	Q.L.	—	—
„ erythrocarpa, F. M.	—	—	—	—	—	Q.L.	—	—
„ xylocarpa, Cunn.	—	—	—	—	N.S.W.	Q.L.	—	—
„ nervosa, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ Bidwillii, Benth.	—	—	—	—	—	Q.L.	—	—
„ grandissima, F. M.	—	—	—	—	—	Q.L.	—	—
„ pyriformis, F. M.	—	—	—	—	—	Q.L.	—	—
„ anodonta, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ lentiscifolia, Pers.	—	—	—	—	N.S.W.	—	—	—
„ exangulata, F. M.	—	—	—	—	—	Q.L.	—	—
„ tenax, F. M.	—	—	—	—	N.S.W.	—	—	—
„ distylis, F. M.	—	—	—	—	N.S.W.	—	—	—
„ lachnocarpa, F. M.	—	—	—	—	—	Q.L.	—	—
„ Alphandiana, F. M.	—	—	—	—	—	Q.L.	—	—
„ Martyana, F. M.	—	—	—	—	—	Q.L.	—	—
„ diphyllostegia, F. M.	—	—	—	—	—	Q.L.	—	—
Nephelium semiglaucum, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ connatum, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ subdentatum, F. M.	—	—	—	—	N.S.W.	—	—	—
„ tomentosum, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ coriaceum, Benth.	—	—	—	—	—	Q.L.	—	—
„ foveolatum, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ leiocarpum, F. M.	—	—	—	V.	N.S.W.	Q.L.	—	—
„ Beckleri, Benth.	—	—	—	—	N.S.W.	—	—	—
„ divaricatum, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ Leichhardtii, F. M.	—	—	—	—	—	Q.L.	—	—
Heterodendron oleifolium, Desf.	W.A.	S.A.	—	V.	N.S.W.	Q.L.	—	C.A.
Sapindus Australis, Benth.	—	—	—	—	—	Q.L.	—	—
Atalaya salicifolia, Bl.	—	—	—	—	—	—	N.A.	—
„ multiflora, Benth.	—	—	—	—	—	Q.L.	—	—
„ hemiglauca, F. M.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Harpullia alata, F. M.	—	—	—	—	N.S.W.	—	—	—
„ Hillii, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ Leichhardtii, F. M.	—	—	—	—	—	—	N.A.	—
„ Wadsworthii, F. M.	—	—	—	—	—	Q.L.	—	—
„ pendula, Planch.	—	—	—	—	N.S.W.	Q.L.	—	—
Akania Hillii, J. Hook.	—	—	—	—	N.S.W.	Q.L.	—	—

CELASTRINEÆ.

Hedraianthera porphyropetala, F. M.	—	—	—	—	—	Q.L.	—	—
Euonymus Australianus, F. M.	—	—	—	—	—	Q.L.	—	—
Celastrus Australis, Harv. & Muell.	—	—	—	V.	N.S.W.	Q.L.	—	—
„ dispermus, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ bilocularis, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
„ pittosporeus, F. M.	—	—	—	—	—	Q.L.	—	—
„ Cunninghami, F. M.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Gymnosporia montana, W. and A.	—	—	—	—	—	Q.L.	—	—
Denhamia obscura, Meissn.	—	—	—	—	—	Q.L.	N.A.	—
„ pittosporoides, F. M.	—	—	—	—	—	Q.L.	—	—
Elæodendron Australe, Vent.	—	—	—	—	N.S.W.	Q.L.	—	—
Siphonodon Australis, Benth.	—	—	—	—	N.S.W.	Q.L.	—	—

RHAMNACEÆ.

Ventilago viminalis, Hook.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Zizyphus jujuba, Lam.	—	—	—	—	—	Q.L.	—	—
„ quadrilocularis, F. M.	—	—	—	—	—	—	N.A.	—
Gouania Australiana, F. M.	—	—	—	—	—	Q.L.	—	—
Rhamnus Vitiensis, Benth.	—	—	—	—	—	Q.L.	—	—
Colubrina Asiatica, Brogn.	—	—	—	—	—	Q.L.	N.A.	—
Alphitonia excelsa, Reiss.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Emmenosperma alphitonoides, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—

Pomaderris grandis, F. M.	W.A.	—	—	—	—	—	—	—
,, elliptica, Lab.	—	—	T.	V.	N.S.W.	—	—	—
,, apetala, Lab.	—	—	T.	V.	N.S.W.	—	—	—
,, betulina, Cunn.	—	—	—	V.	N.S.W.	—	—	—
,, subrepanda, F. M.	—	—	—	V.	—	—	—	—
Trymalium albicans, Reiss.	W.A.	—	—	—	—	—	—	—
,, Billardierii, Fenzl.	W.A.	—	—	—	—	—	—	—

URTICEÆ.

Laportea gigas, Wedd.	—	—	—	—	N.S.W.	—	—	—
,, photinifolia, Wedd.	—	—	—	—	—	Q.L.	—	—
Pipturus propinquus, Wedd.	—	—	—	—	N.S.W.	Q.L.	—	—
Epicarpurus orientalis, Blume.	—	—	—	—	N.S.W.	Q.L.	—	—
Celtis Philippinensis, Blanco	—	—	—	—	—	Q.L.	—	—
,, ingens, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, strychnoides, Planch.	—	—	—	—	—	Q.L.	N.A.	—
Sponia aspera, Decaisne	—	—	—	V.	N.S.W.	Q.L.	N.A.	—
Morus Brunoniana, Endl.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Calcar Galli, Cunn.	—	—	—	—	N.S.W.	Q.L.	—	—
Malvaisia Cunninghami, Pl.	—	—	—	—	—	Q.L.	—	—
Ficus stipulata, Thunb.	—	—	—	—	—	Q.L.	—	—
,, leucotricha, Miq.	—	—	—	—	—	—	N.A.	—
,, macrophylla, Desf.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Muelleri, Miq.	—	—	—	—	N.S.W.	—	—	—
,, Leichhardtii, Miq.	—	—	—	—	—	Q.L.	—	—
,, platypoda, Cunn.	W.A.	—	—	—	N.S.W.	Q.L.	N.A.	C.A.
,, rubiginosa, Vent.	—	—	—	—	N.S.W.	Q.L.	—	—
,, puberula, Miq.	—	—	—	—	—	—	N.A.	—
,, nesophila, F. M.	—	—	—	—	—	—	N.A.	—
,, vitellina, F. M.	—	—	—	—	—	—	N.A.	—
,, lachnoculon, Miq.	—	—	—	—	—	—	N.A.	—
,, psychotriifolia, Miq.	—	—	—	—	—	Q.L.	—	—
,, Fraseri, Miq.	—	—	—	—	—	Q.L.	—	—
,, brachypoda, Miq.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, eugenioides, F. M.	—	—	—	—	—	—	N.A.	—
,, pilosa, Reinw.	—	—	—	—	—	—	N.A.	—
,, squamellosa, Miq.	—	—	—	—	N.S.W.	—	—	—
,, Backhousii, Miq.	—	—	—	—	N.S.W.	—	—	—
,, nitida, Thunb.	—	—	—	—	—	—	N.A.	—
,, aspera, Forst.	—	—	—	V.	N.S.W.	Q.L.	N.A.	—
,, orbicularis, Cunn.	—	—	—	—	—	—	N.A.	—
,, indecora, Miq.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, aculeata, Cunn.	—	—	—	—	—	—	N.A.	—
,, opposita, Miq.	—	—	—	—	—	Q.L.	—	—
,, Fitzalani, Miq.	—	—	—	—	—	Q.L.	—	—
,, salicina, F. M.	—	—	—	—	—	—	N.A.	—
,, vesca, F. M.	—	—	—	—	—	Q.L.	—	—
,, magnifolia, F. M.	—	—	—	—	—	Q.L.	—	—

EUPHORBIACEÆ.

Actephila grandifolia, Baill.	—	—	—	—	N.S.W.	—	—	—
,, Mooreana, Baill.	—	—	—	—	N.S.W.	Q.L.	—	—
Antidesma paniculatum, Roxb.	—	—	—	—	—	—	N.A.	—
Petalostigma quadriloculare, F. M.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Phyllanthus Ferdinandi, J. Müll.	—	—	—	—	N.S.W.	Q.L.	—	—
Hemicyclia sepiaria, Wight & Arn.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Bridelia ovata, Decaisne	—	—	—	—	N.S.W.	Q.L.	—	—
Cleistanthus Cunninghami, J. Müll.	—	—	—	—	N.S.W.	Q.L.	—	—
Croton stigmatosus, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, tomentellus, F. M.	—	—	—	—	—	—	N.A.	—
,, Verreauxii, Baill.	—	—	—	—	N.S.W.	Q.L.	—	—
,, insularis, Baill.	—	—	—	—	—	Q.L.	—	—
,, Arnhemicus, J. Müll.	—	—	—	—	—	Q.L.	N.A.	—
Aleurites triloba, Forst.	—	—	—	—	—	Q.L.	—	—

Claoxylon Australe, Baill.	—	—	—	V.	N.S.W.	Q.L.	—	—
Acalypha nemorum, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
Baloghia lucida, Endl.	—	—	—	—	N.S.W.	Q.L.	—	—
Codiæum chrysosticton, Spreng.	—	—	—	—	—	Q.L.	—	—
Macaranga Tanarius, J. Müll.	—	—	—	—	—	Q.L.	—	—
Mallotus claoxyloides, J. Müll.	—	—	—	—	N.S.W.	Q.L.	—	—
,, nesophilus, J. Müll.	—	—	—	—	—	Q.L.	—	—
,, Philippinensis, J. Müll.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Excæcaria Agallogha, L.	—	—	—	—	—	Q.L.	N.A.	—
Carumbium Sieberi, J. Müll.	—	—	—	V.	N.S.W.	Q.L.	—	—

LEGUMINOSÆ.

Jacksonia scoparia, Sm.	—	—	—	—	N.S.W.	Q.L.	—	—
,, thesioides, Cunn.	—	—	—	—	—	—	N.A.	—
Viminaria denudata, Sm.	W.A.	S.A.	—	V.	N.S.W.	Q.L.	—	—
Pultenæa altissima, F. M.	—	—	—	V.	N.S.W.	—	—	—
Goodia lotifolia, Salisb.	W.A.	S.A.	T.	V.	N.S.W.	—	—	—
Sesbania grandiflora, Pers.	—	—	—	—	—	—	N.A.	—
Erythrina Vespertilio, Benth.	—	—	—	—	—	Q.L.	N.A.	—
,, Indica, L.	—	—	—	—	—	Q.L.	N.A.	—
Sophora tomentosa, L.	—	—	—	—	N.S.W.	Q.L.	—	—
Castanospermum Australe, Cunn.	—	—	—	—	N.S.W.	Q.L.	—	—
Barklya syringifolia, F. M.	—	—	—	—	—	Q.L.	—	—
Peltophorum ferrugineum, Benth.	—	—	—	—	—	—	N.A.	—
Cassia Brewsteri, F. M.	—	—	—	—	—	Q.L.	—	—
Tamarindus Indica, L.	—	—	—	—	—	—	N.A.	—
Bauhinia Leichhardtii, F.M.	—	—	—	—	—	—	N.A.	C.A.
,, Carronii, F. M.	—	—	—	—	—	Q.L.	—	—
,, Hookeri, F. M.	—	—	—	—	—	Q.L.	N.A.	—
Cynometra ramiflora, L.	—	—	—	—	—	Q.L.	—	—
Erythrophlæum Laboucherii, F. M.	—	—	—	—	—	Q.L.	N.A.	C.A.
Adenanthera Pavonina, L.	—	—	—	—	—	Q.L.	—	—
,, abrosperma, F. M.	—	—	—	—	—	Q.L.	—	—
Acacia Peuce, F. M.	—	S.A.	—	—	—	—	—	—
,, papyrocarpa, Benth.	—	S.A.	—	—	—	—	—	—
,, verniciflua, Cunn.	—	S.A.	T.	V.	N.S.W.	—	—	—
,, leprosa, Sieb.	—	—	—	V.	N.S.W.	—	—	—
,, dodonæifolia, Wendl.	—	S.A.	—	—	—	—	—	—
,, Gnidium, Benth.	—	—	—	—	—	Q.L.	—	—
,, Sentis, F. M.	—	S.A.	—	V.	N.S.W.	Q.L.	—	C.A.
,, fasciculifera, F. M.	—	—	—	—	—	Q.L.	—	—
,, falcata, Willd.	—	—	—	—	N.S.W.	Q.L.	—	—
,, penninervis, Sieb.	—	—	T.	V.	N.S.W.	Q.L.	—	—
,, retinodes, Schlecht.	—	S.A.	—	V.	—	—	—	—
,, neriifolia, Cunn.	—	—	—	—	N.S.W.	Q.L.	—	—
,, salingna, Wendl.	W.A.	—	—	—	—	—	—	—
,, cyanophylla, Lindl.	W.A.	—	—	—	—	—	—	—
,, pycnantha, Benth.	—	S.A.	—	V.	—	—	—	—
,, notabilis, F. M.	—	S.A.	—	—	N.S.W.	—	—	—
,, salicina, Lindl.	W.A.	S.A.	—	V.	N.S.W.	Q.L.	N.A.	C.A.
,, rostellifera, Benth.	W.A.	—	—	—	—	—	—	—
,, lunata, Sieb.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, pravissima, F. M.	—	—	—	V.	N.S.W.	—	—	—
,, supporosa, F. M.	—	—	—	V.	N.S.W.	—	—	—
,, Simsii, Cunn.	—	—	—	—	—	Q.L.	N.A.	—
,, homalophylla, Cunn.	—	S.A.	—	V.	N.S.W.	—	—	—
,, pendula, Cunn.	—	—	—	—	N.S.W.	Q.L.	—	—
,, stenophylla, Cunn.	—	S.A.	—	V.	N.S.W.	Q.L.	N.A.	C.A.
,, hemignosta, F. M.	—	—	—	—	—	—	N.A.	—
,, Melanoxylon, Br.	—	S.A.	T.	V.	N.S.W.	—	—	—
,, implexa, Benth.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, harpophylla, Benth.	—	—	—	—	—	Q.L.	—	—
,, excelsa, Benth.	—	—	—	—	—	Q.L.	—	—
,, complanata, Cunn.	—	—	—	—	N.S.W.	Q.L.	—	—

Acacia binervata, Cand.	—	—	—	—	N.S.W.	—	—	—
,, latescens, Benth.	—	—	—	—	—	—	N.A.	—
,, Dallachiana, F. M.	—	—	—	V.	—	—	—	—
,, longifolia, W.	—	S.A.	T.	V.	N.S.W.	Q.L.	—	—
,, cyperophylla, F. M.	—	—	—	—	—	Q.L.	—	C.A.
,, doratoxylon, Cunn.	—	—	—	—	N.S.W.	Q.L.	—	—
,, acuminata, Benth.	W.A.	—	—	—	—	—	—	—
,, delibrata, Cunn.	—	—	—	—	—	—	N.A.	—
,, torulosa, Benth.	—	—	—	—	—	Q.L.	N.A.	—
,, julifera, Benth.	—	—	—	—	—	Q.L.	—	—
,, Solandri, Benth.	—	—	—	—	—	Q.L.	—	—
,, leptostachya, Benth.	—	—	—	—	—	Q.L.	—	—
,, glaucescens, Willd.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Cunninghami, Hook.	—	—	—	—	N.S.W.	Q.L.	—	—
,, pachycarpa, F. M.	—	—	—	—	—	—	N.A.	—
,, tumida, F. M.	—	—	—	—	—	—	N.A.	—
,, crassocarpa, Cunn.	—	—	—	—	—	Q.L.	N.A.	—
,, auriculiformis, Cunn.	—	—	—	—	—	Q.L.	—	—
,, elata, Cunn.	—	—	—	—	N.S.W.	—	—	—
,, discolor, Willd.	—	—	T.	V.	N.S.W.	—	—	—
,, decurrens, Willd.	—	S.A.	T.	V.	N.S.W.	—	—	—
,, pallida, F. M.	—	—	—	—	—	—	N.A.	—
Pithecolobium lophanthum, F. M.	W.A.	—	—	—	—	—	—	—
,, Thozetii, F. M.	—	—	—	—	—	Q.L.	—	—
,, procerum, F. M.	—	—	—	—	—	Q.L.	—	—
,, canescus, F. M.	—	—	—	—	—	Q.L.	—	—
,, pruinosum, Benth.	—	—	—	—	N.S.W.	Q.L.	—	—
,, moniliferum, Benth.	—	—	—	—	—	—	N.A.	—
,, Tozerii, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Hendersonii, F.M.	—	—	—	—	N.S.W.	Q.L.	—	—
Archidendron Vaillantii, F.M.	—	—	—	—	—	Q.L.	—	—

MYRTACEÆ.

Calycothrix arborescens, F. M.	—	—	—	—	—	—	N.A.	—
Thryptomene oligandra, F. M.	—	—	—	—	—	Q.L.	N.A.	—
Astartea fascicularis, Endl.	W.A.	—	—	—	—	—	—	—
Agonis juniperina, Schauer	W.A.	—	—	—	—	—	—	—
,, flexuosa, Schauer	W.A.	—	—	—	—	—	—	—
Leptospermum lævigatum, F. M.	—	S.A.	T.	V.	N.S.W.	Q.L.	—	—
,, flavescens, Sm.	—	—	T.	V.	N.S.W.	Q.L.	—	—
,, lanigerum, Sm.	—	S.A.	T.	V.	N.S.W.	—	—	—
Kunzea pedunculasis, F. M.	—	—	—	V.	N.S.W.	—	—	—
,, corifolia, Reichenb.	—	—	T.	V.	N.S.W.	—	—	—
Callistemon speciosus, Cand.	W.A.	—	—	—	—	—	—	—
,, lanceolatus, Cand.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, salignus, Cand.	—	S.A.	T.	V.	N.S.W.	Q.L.	—	—
,, brachyandrus, Lindl.	—	S.A.	—	V.	N.S.W.	—	—	—
Lamarchea hakeifolia, Gaud.	W.A.	—	—	—	—	—	—	—
Melaleuca decussata, Br.	—	S.A.	—	V.	—	—	—	—
,, acacioides, F. M.	—	—	—	—	—	—	N.A.	—
,, pauciflora, Turcz.	—	—	—	—	N.S.W.	—	—	—
,, squarrosa, Sm.	—	S.A.	T.	V.	N.S.W.	—	—	—
,, linariifolia, Sm.	—	—	—	—	N.S.W.	Q.L.	—	—
,, leucodendron, L.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, lasiandra, F. M.	—	—	—	—	—	—	N.A.	—
,, genistifolia, Sm.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, stypheloides, Sm.	—	—	—	—	N.S.W.	—	—	—
,, parviflora, Lindl.	W.A.	S.A.	—	V.	—	—	—	—
,, armillaris, Sm.	—	—	—	V.	N.S.W.	—	—	—
,, raphiophylla, Schauer	W.A.	—	—	—	—	—	—	—
,, cuticularis, Lab.	W.A.	—	—	—	—	—	—	—
,, globifera, Br.	W.A.	—	—	—	—	—	—	—
,, nodosa, Sm.	—	—	—	—	N.S.W.	Q.L.	—	—
,, ericifolia, Sm.	—	S.A.	T.	V.	N.S.W.	—	—	—

Melaleuca minutifolia, F. M.	—	—	—	—	—	—	N.A.	—
Angophora cordifolia, Cav.	—	—	—	—	N.S.W.	—	—	—
,, subvelutina, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, intermedia, Cand.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, lanceolata, Cav.	—	—	—	—	N.S.W.	Q.L.	—	—
Eucalyptus stellulata, Sieb.	—	—	—	V.	N.S.W.	—	—	—
,, coriacea, Cunn.	—	—	T.	V.	N.S.W.	—	—	—
,, virgata, Sieb.	—	—	—	V.	N.S.W.	—	—	—
,, amygdalina, Lab.	—	—	T.	V.	N.S.W.	—	—	—
,, coccifera, Hook.	—	—	T.	—	—	—	—	—
,, obliqua, L'Her.	—	S.A.	T.	V.	N.S.W.	—	—	—
,, rigida, Sieb.	—	—	—	—	N.S.W.	—	—	—
,, capitellata, Sm.	—	—	—	—	N.S.W.	—	—	—
,, santalifolia, F. M.	—	S.A.	—	—	—	—	—	—
,, macrorrhyncha, F. M.	—	—	—	V.	N.S.W.	—	—	—
,, piperita, Sm.	—	—	—	V.	N.S.W.	—	—	—
,, pilularis, Sm.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, marginata, Sm.	W.A.	—	—	—	—	—	—	—
,, Leucoxylon, F. M.	—	S.A.	—	V.	N.S.W.	—	—	—
,, melliodora, A. C.	—	...	—	V.	N.S.W.	—	—	—
,, gracilis, F. M.	W.A.	S.A.	—	V.	N.S.W.	—	—	—
,, paniculata, Sm.	—	—	—	—	N.S.W.	—	—	—
,, fasciculosa, F. M.	—	S.A.	—	V.	N.S.W.	—	—	—
,, hæmastoma, Sm.	—	—	—	—	N.S.W.	Q.L.	—	—
,, microcorys, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, pruinosa, Schauer	—	—	—	—	—	—	N.A.	—
,, oligantha, Schauer	—	—	—	—	—	—	N.A.	—
,, polyanthemos, Schauer	—	—	—	V.	N.S.W.	Q.L.	N.A.	—
,, Behriana, F. M.	—	S.A.	—	V.	N.S.W.	—	—	—
,, largiflorens, F. M.	—	S.A.	—	V.	N.S.W.	Q.L.	—	—
,, odorata, Behr.	—	S.A.	—	—	—	—	—	—
,, uncinata, Turcz.	W.A.	S.A.	—	V.	N.S.W.	—	—	—
,, hemiphloia, F.M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, stricta, Sieb.	—	—	—	—	N.S.W.	—	—	—
,, decipiens, Endl.	W.A.	—	—	—	—	—	—	—
,, corynocalyx, F. M.	—	S.A.	—	—	—	—	—	—
,, albens, Miq.	—	—	—	V.	N.S.W.	—	—	—
,, Bowmanii, F. M.	—	—	—	—	—	Q.L.	—	—
,, siderophloia, Benth.	—	—	—	—	N.S.W.	Q.L.	—	—
,, melanophloia, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, drepanophylla, F. M.	—	—	—	—	—	Q.L.	N.A.	—
,, trachyphloia, F. M.	—	—	—	—	—	Q.L.	—	—
,, leptophleba, F. M.	—	—	—	—	—	Q.L.	N.A.	—
,, crebra, F. M.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, brachypoda, Turcz.	W.A.	S.A.	—	—	N.S.W.	—	N.A.	C.A.
,, brachyandra, F. M.	—	—	—	—	—	—	N.A.	—
,, pulverulenta, Sims	—	—	—	—	N.S.W.	—	—	—
,, globulus, Lab.	—	—	T.	V.	—	—	—	—
,, longifolia, Link and Otto	—	—	—	V.	N.S.W.	—	—	—
,, conoidea, Benth.	W.A.	—	—	—	—	—	—	—
,, urnigera, J. Hook.	—	—	T.	—	—	—	—	—
,, miniata, Cunn.	—	—	—	—	—	—	N.A.	—
,, robusta, Sm.	—	—	—	—	N.S.W.	—	—	—
,, botryoides, Sm.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, goniocalyx, F. M.	—	—	—	V.	N.S.W.	—	—	—
,, gomphocephala, Cand.	W.A.	—	—	—	—	—	—	—
,, megacarpa, F. M.	W.A.	—	—	—	—	—	—	—
,, cornuta, Labill.	W.A.	—	—	—	—	—	—	—
,, platypus, Hook.	W.A.	—	—	—	—	—	—	—
,, macrandra, F. M.	W.A.	—	—	—	—	—	—	—
,, occidentalis, Endl.	W.A.	—	—	—	—	—	—	—
,, pallidifolia, F. M.	—	—	—	—	—	—	N.A.	—
,, viminalis, Labill.	—	S.A.	T.	V.	N.S.W.	—	—	—
,, rostrata, Schl.	W.A.	S.A.	—	V.	N.S.W.	Q.L.	N.A.	C.A.

Eucalyptus tereticornis, Sm. ...	—	—	—	V.	N.S.W.	Q.L.	—	—
,, platyphylla, F. M.	—	—	—	—	—	Q.L.	N.A.	—
,, tectifica, F. M.	—	—	—	—	—	—	N.A.	—
,, Stuartiana, F. M.	—	S.A.	T.	V.	N.S.W.?	—	—	—
,, patellaris, F. M.	—	—	—	—	—	—	N.A.	—
,, rudis, Endl.	W.A.	—	—	—	—	—	—	—
,, saligna, Sm.	—	—	—	—	N.S.W.	—	—	—
,, resinifera, Sm.	—	—	—	—	N.S.W.	Q.L.	—	—
,, pellita, F. M....	—	—	—	—	—	Q.L.	—	—
,, Gunnii, J. Hook.	—	—	T.	V.	—	—	—	—
,, patens, Benth.	W.A.	—	—	—	—	—	—	—
,, concolor, Schauer	W.A.	—	—	—	—	—	—	—
,, decurva, F. M.	W.A.	—	—	—	—	—	—	—
,, aspera, F. M.	—	—	—	—	—	—	N.A.	—
,, grandifolia, Br.	—	—	—	—	—	—	N.A.	—
,, clavigera, Cunn.	—	—	—	—	—	—	N.A.	—
,, tesselaris, F. M.	—	—	—	—	—	Q.L.	N.A.	—
,, phœnicea, F. M.	—	—	—	—	—	—	N.A.	—
,, colossea, F. M.	W.A.	—	—	—	—	—	—	—
,, loxophleba, Benth.	W.A.	—	—	—	—	—	—	—
,, fœcunda, Schauer	W.A.	—	—	—	—	—	—	—
,, redunca, Schauer	W.A.	—	—	—	—	—	—	—
,, ferruginea, Schauer	—	—	—	—	—	—	N.A.	—
,, setosa, Schauer	—	—	—	—	—	Q.L.	N.A.	—
,, melissiodora, Lindl.	—	—	—	—	—	Q.L.	—	—
,, latifolia, F. M.	—	—	—	—	—	—	N.A.	—
,, ptychocarpa, F. M.	—	—	—	—	—	—	N.A.	—
,, calophylla, Br.	W.A.	—	—	—	—	—	—	—
,, ficifolia, F. M.	W.A.	—	—	—	—	—	—	—
,, corymbosa, Sm.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, citriodora, Hook.	—	—	—	—	N.S.W.	Q.L.	—	—
,, terminalis, F. M.	—	—	—	—	—	Q.L.	N.A.	—
,, dichromophloia, F. M. ...	—	—	—	—	—	—	N.A.	—
,, apiophora, F. M.	—	—	—	—	—	—	N.A.	—
,, maculata, Hook.	—	—	—	—	N.S.W.	Q.L.	—	—
,, eximia, Schauer	—	—	—	—	N.S.W.	—	—	—
,, erythrocorys, F. M.... ...	W.A.	—	—	—	—	—	—	—
,, tetragona, F. M.	W.A.	—	—	—	—	—	—	—
,, tetrodonta, F. M.	W.A.	—	—	—	—	—	—	—
Tristania neriifolia, Br.	—	—	—	—	N.S.W.	—	—	—
,, suaveolens, Sm.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, conferta, Br.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, lactiflora, F. M.	—	—	—	—	—	—	N.A.	—
,, exiliflora, F. M.	—	—	—	—	—	Q.L.	—	—
,, laurina, Br....	—	—	—	V.	N.S.W.	Q.L.	—	—
,, psidioides, Cunn.	—	—	—	—	—	—	N.A.	—
,, umbrosa, Cunn.	—	—	—	—	—	—	N.A.	—
Metrosideros glomulifera, Sm. ...	—	—	—	—	N.S.W.	Q.L.	—	—
,, leptopetala, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, ternifolia, F. M.	—	—	—	—	—	Q.L.	—	—
,, eucalyptoides, F. M. ...	—	—	—	—	—	—	N.A.	—
,, chrysantha, F. M.	—	—	—	—	—	Q.L.	—	—
,, paradoxa, F. M.	—	—	—	—	—	—	N.A.	—
Backhousia myrtifolia, Hook. & Harv.	—	—	—	—	N.S.W.	Q.L.	—	—
,, angustifolia, F. M.	—	—	—	—	—	Q.L.	—	—
,, sciadophora, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, citriodora, F. M.	—	—	—	—	—	Q.L.	—	—
Myrtus Tozerii, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, rhytisperma, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, gonoclada, F. M.	—	—	—	—	—	Q.L.	—	—
,, Hillii, Benth....	—	—	—	—	—	Q.L.	—	—
,, Bidwillii, Benth.	—	—	—	—	—	Q.L.	—	—
,, ramulosa, Benth.	—	—	—	—	—	Q.L.	—	—
,, acmenoides, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—

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Myrtus fragrantissima, F. M. ...	—	—	—	—	N.S.W.	Q.L.	—	—
,, sessiliflora, F. M.	—	—	—	—	—	Q.L.	—	—
,, melastomoides, F. M. ..	—	—	—	—	N.S.W.	Q.L.	—	—
,, argentea, Hill.	—	—	—	—	N.S.W.	Q.L.	—	—
,, elachantha, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, macrocarpa, F. M.	—	—	—	—	—	Q.L.	—	—
Eugenia Smithii, Poir.	—	—	—	V.	N.S.W.	Q.L.	N.A.	—
,, Ventenatii, Benth.	—	—	—	—	N.S.W.	Q.L.	—	—
,, leptantha, Wight	—	—	—	—	—	Q.L.	—	—
,, jambolana, Lam.	—	—	—	—	N.S.W.	Q.L.	—	—
,, cormiflora, F. M.	—	—	—	—	—	Q.L.	—	—
,, Tierneyana, F. M.	—	—	—	—	—	Q.L.	—	—
,, grandis, Wight	—	—	—	—	—	Q.L.	—	—
,, suborbicularis, Benth. ..	—	—	—	—	—	Q.L.	—	—
,, Wilsonii, F. M.	—	—	—	—	—	Q.L.	—	—
,, eucalyptoides, F. M.... ...	—	—	—	—	—	Q.L.	—	—
,, angophoroides, F. M. ...	—	—	—	—	—	Q.L.	—	—
,, Armstrongii, Benth.... ...	—	—	—	—	—	—	N.A.	—
,, oleosa, F. M....	—	—	—	—	—	Q.L.	—	—
,, Dallachyana, F. M.	—	—	—	—	—	Q.L.	—	—
,, jucunda, F. M.	—	—	—	—	—	Q.L.	—	—
Barringtonia Careya, F. M. ...	—	—	—	—	—	Q.L.	N.A.	—
,, speciosa, L. Fil.	—	—	—	—	—	Q.L.	—	—
,, acutangula, Gaertn.	—	—	—	—	—	Q.L.	—	—

CHRYSOBALANEÆ.

Parinarium Nonda, F. M.... ...	—	—	—	—	—	Q.L.	N.A.	—
,, Griffithianum, Benth. ...	—	—	—	—	—	Q.L.	N.A.	—

SAXIFRAGEÆ.

Quintinia Sieberi, A. Cand. ...	—	—	—	—	N.S.W.	—	—	—
,, Verdonii, F. M.	—	—	—	—	N.S.W.	—	—	—
Polyosma Cunninghami, Br. ...	—	—	—	—	N.S.W.	—	—	—
Anopterus Macleayana, F. M. ...	—	—	—	—	N.S.W.	Q.L.	—	—
,, glandulosa, Lab.	—	—	T.	—	—	—	—	—
Callicoma serratifolia, Andr. ...	—	—	—	—	N.S.W.	Q.L.	—	—
,, Stutzerii, F. M.	—	—	—	—	—	Q.L.	—	—
Anodopetalum biglandulosum, Cunn.	—	—	T.	—	—	—	—	—
Aphanopetalum resinosum, Endl...	—	—	—	V.	N.S.W.	Q.L.	—	—
Ceratopetalum gummiferum, Sm.	—	—	—	—	N.S.W.	—	—	—
,, apetalum, D. Don	—	—	—	—	N.S.W.	—	—	—
Schizomeria ovata, D. Don... ...	—	—	—	—	N.S.W.	—	—	—
Davidsonia pruriens, F. M. ...	—	—	—	—	—	Q.L.	—	—
Gillbeea adenopetala, F. M. ...	—	—	—	—	—	Q.L.	—	—
Weinmannia paniculosa, F. M. ...	—	—	—	—	N.S.W.	—	—	—
,, rubifolia, Benth.	—	—	—	—	N.S.W.	—	—	—
,, Benthami, F. M.	—	—	—	—	N.S.W.	—	—	—
,, Biagiana, F. M.	—	—	—	—	—	Q.L.	—	—
Tetracarpæa Tasmanica, J. Hook.	—	—	T.	—	—	—	—	—
Eucryphia Billardierii, Spach ...	—	—	T.	—	—	—	—	—
,, Moorei, F.M....	—	—	—	—	N.S.W.	—	—	—

LYTHRACEÆ.

Pemphis acidula, Forst.	—	—	—	—	—	Q.L.	N.A.	—
Sonneratia acida, L.	—	—	—	—	—	Q.L.	N.A.	—

RHIZOPHOREÆ.

Rhizophora mucronata, Lam. ...	—	—	—	—	—	Q.L.	N.A.	—
Ceriops Candolleana, Arn.... ...	—	—	—	—	—	Q.L.	N.A.	—
Bruguiera Rheedei, Blume. ...	—	—	—	—	—	Q.L.	N.A.	—
,, gymnorrhiza, Lam.	—	—	—	—	—	Q.L.	N.A.	—
Carallia integrifolia, Cand. ...	—	—	—	—	—	Q.L.	N.A.	—

COMBRETACEÆ.

Terminalia platyptera, F. M.	—	—	—	—	—	—	N.A.	—
,, volucris, Br.	—	—	—	—	—	—	N.A.	—
,, oblongata, F. M.	—	—	—	—	—	Q.L.	—	—
,, bursarina, F. M.	—	—	—	—	—	—	N.A.	—
,, circumalata, F. M.	—	—	—	—	—	—	N.A.	—
,, pterocarpa, F. M.	—	—	—	—	—	—	N.A.	—
,, Thozetii, Benth.	—	—	—	—	—	Q.L.	—	—
,, melanocarpa, F. M.	—	—	—	—	—	Q.L.	N.A.	—
,, Muelleri, Benth.	—	—	—	—	—	Q.L.	—	—
,, latipes, Benth.	—	—	—	—	—	—	N.A.	—
,, edulis, F. M.	—	—	—	—	—	—	N.A.	—
,, discolor, F. M.	—	—	—	—	—	—	N.A.	—
,, porphyrocarpa, F. M.	—	—	—	—	—	Q.L.	—	—
,, platyphylla, F. M.	—	—	—	—	—	—	N.A.	—
,, petiolaris, Cunn.	—	—	—	—	—	—	N.A.	—
,, erythrocarpa, F. M.	—	—	—	—	—	—	N.A.	—
,, grandiflora, Benth.	—	—	—	—	—	—	N.A.	—
Lumnitzera racemosa, Willd.	—	—	—	—	—	Q.L.	N.A.	—
,, coccinea, Wight and Arn.	—	—	—	—	—	Q.L.	—	—
Macropteranthes montana, F. M.	—	—	—	—	—	Q.L.	—	—
,, Kekwickii, F. M.	—	—	—	—	—	—	N.A.	—
,, Leichhardtii, F. M.	—	—	—	—	—	Q.L.	—	—
Gyrocarpus Jacquinii, Roxb.	—	—	—	—	—	Q.L.	N.A.	—

LAURINEÆ.

Cinnamomum Laubatii, F. M.	—	—	—	—	—	Q.L.	—	—
Cryptocarya glaucescens, Br.	—	—	—	—	N.S.W.	Q.L.	—	—
,, microneura, Meissn.	—	—	—	—	N.S.W.	Q.L.	—	—
,, patentinervis, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, obovata, Br.	—	—	—	—	N.S.W.	—	—	—
,, obtusifolia, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Mackinnoniana, F. M.	—	—	—	—	—	Q.L.	—	—
,, hypospodia, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Meissneri, F. M.	—	—	—	—	N.S.W.	—	—	—
,, hypoglauca, Meissn.	—	—	—	—	—	Q.L.	—	—
,, Murrayi, F. M.	—	—	—	—	—	Q.L.	—	—
Caryodaphne Browniana, Nees	—	—	—	—	N.S.W.	Q.L.	—	—
,, Australis, A. Br.	—	—	—	—	N.S.W.	Q.L.	—	—
Endiandra virens, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Muelleri, Meissn.	—	—	—	—	N.S.W.	Q.L.	—	—
,, glauca, Br.	—	—	—	—	—	Q.L.	—	—
,, Sieberi, Nees	—	—	—	—	N.S.W.	Q.L.	—	—
,, hypotephra, F. M.	—	—	—	—	—	Q.L.	—	—
Litsæa dealbata, Nees	—	—	—	—	N.S.W.	Q.L.	—	—
Tetranthera laurifolia, Jacq.	—	—	—	—	—	Q.L.	—	—
,, Bindoniana, F. M.	—	—	—	—	—	Q.L.	—	—
,, Fawcettiana, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, reticulata, Meissn.	—	—	—	—	—	Q.L.	—	—
,, ferruginea, Br.	—	—	—	—	—	Q.L.	—	—

HERNANDIEÆ.

Hernandia peltata, Meissn.	—	—	—	—	—	Q.L.	—	—

SAMYDACEÆ.

Homalium Vitiense, Benth.	—	—	—	—	—	Q.L.	—	—
,, brachybotrys, F. M.	—	—	—	—	—	Q.L.	N.A.	—
Casearia Dallachii, F. M.	—	—	—	—	—	Q.L.	—	—
,, esculenta, Roxb.	—	—	—	—	—	Q.L.	—	—

UMBELLIFERÆ.

Astrotriche floccosa, Cand.	—	—	—	—	N.S.W.	Q.L.	—	—
Panax palmaceus, F. M.	—	—	—	V.	N.S.W.	Q.L.	—	—

Panax mollis, Benth.	—	—	—	—	—	Q.L.	—	—
,, Macgillivrayi, Benth. ...	—	—	—	—	—	Q.L.	—	—
,, sambucifolius, Sieb. ..	—	—	T.	V.	N.S.W.	—	—	—
,, cephalobotrys, F. M ...	—	—	—	—	N.S.W.	—	—	—
,, elegans, Moore and Muell. ...	—	—	—	—	N.S.W.	Q.L.	—	—
Mackinlaya macrosciadea, F. M. ...	—	—	—	—	—	Q.L.	—	—
Hedera Australiana, F. M. ...	—	—	—	—	—	Q.L.	—	—
Heptopleurum venulosum, Seem.	—	—	—	—	—	Q.L.	—	—
Brassaia actinophylla, Endl. ...	—	—	—	—	—	Q.L.	—	—

II.—Synpetaleæ.

Cornaceæ.

Marlea Vitiensis, Benth.	—	—	—	—	N.S.W.	Q.L.	—	—

Caprifoliaceæ.

Sambucus xanthocarpa, F. M. ...	—	—	—	V.	N.S.W.	Q.L.	—	—

Rubiaceæ.

Sarcocephalus cordatus, Miq. ...	—	—	—	—	—	Q.L.	N.A.	—
Gardenia edulis, F. M.	—	—	—	—	—	—	N.A.	—
,, resinosa, F. M.	—	—	—	—	—	—	N.A.	—
,, pyriformis, Cunn.	—	—	—	—	—	—	N.A.	—
,, megasperma, F. M.	—	—	—	—	—	—	N.A.	—
,, Macgillivrayi, Benth. ...	—	—	—	—	—	Q.L.	—	—
,, ochreata, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Jardinei, F. M.	—	—	—	—	—	Q.L.	—	—
,, Fitzalani, F. M.	—	—	—	—	—	Q.L.	—	—
Webera Dallachiana, F. M. ...	—	—	—	—	—	Q.L.	—	—
Diplospora Australis, Benth. ...	—	—	—	—	—	Q.L.	—	—
Ixora Pavetta, Roxb.	—	—	—	—	—	Q.L.	—	—
,, tomentosa, Roxb.	—	—	—	—	—	—	N.A.	—
,, Timorensis, Cand.	—	—	—	—	—	Q.L.	N.A.	—
,, Beckleri, Benth.	—	—	—	—	N.S.W.	—	—	—
Timonius Rumphii, Cand. ...	—	—	—	—	—	Q.L.	N.A.	—
Antirrhœa tenuiflora, F. M. ...	—	—	—	—	—	Q.L.	—	—
Hodgkinsonia ovatiflora, F. M. ...	—	—	—	—	N.S.W.	Q.L.	—	—
Canthium lucidum, Hook. and Arn.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, oleifolium, Hook.	—	—	—	—	N.S.W.	Q.L.	N.A.	C.A.
,, coprosmoides, F. M. ...	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Psychotria nesophila, F. M. ...	—	—	—	—	—	Q.L.	N.A.	—
Coprosma microphylla, Cunn. ...	—	—	T.	V.	N.S.W.	—	—	—

Loranthaceæ.

Nuytsia floribunda, Br.	W.A.	—	—	—	—	—	—	—

Elæagneæ.

Elæagnus latifolia, L.	—	—	—	—	—	Q.L.	—	—

Santalaceæ.

Exocarpus latifolia, Br.	—	—	—	—	—	Q.L.	N.A.	—
,, cupressiformis, Lab.	—	S.A.	—	V.	N.S.W.	Q.L.	—	—
,, pendula, F. M.	—	S.A.	—	V.	N.S.W.	—	—	—
,, dasystachys, Schl.	—	S.A.	—	V.	N.S.W.	—	—	—
,, glandulacea, Miq.	W.A.	—	—	—	—	—	—	—
Santalum lanceolatum, Br. ...	—	—	—	—	—	Q.L.	N.A.	C.A.
,, acuminatum, A. Cand. ...	—	S.A.	—	V.	N.S.W.	—	—	—
,, persicarium, F. M.	—	S.A.	—	V.	N.S.W.	—	—	—
,, cygnorum, Miq.	W.A.	—	—	—	—	—	—	—
,, obtusifolium, Br.	—	—	—	—	N.S.W.	—	—	—

PROTEACEÆ.

Cenarrhenes nitida, Lab.	—	—	T.	—	—	—	—	—
Persoonia arborea, F. M.	—	—	—	V.	—	—	—	—
,, longifolia, Br.	W.A.	—	—	—	—	—	—	—
,, linearis, Br.	—	—	—	V.	N.S.W.	—	—	—
,, laureola, Lindl.	W.A.	—	—	—	—	—	—	—
Adenanthos sericea, Lab.	W.A.	—	—	—	—	—	—	—
,, apiculata, Br.	W.A.	—	—	—	—	—	—	—
Grevillea heliosperma, Br.	—	—	—	—	—	—	N.A.	—
,, Alphonsiana, F. M.	—	—	—	—	—	—	—	C.A.
,, pyramidalis, Cunn.	—	—	—	—	—	—	N.A.	—
,, robusta, Cunn.	—	—	—	—	N.S.W.	Q.L.	—	—
,, refracta, Br.	—	—	—	—	—	—	N.A.	—
,, ceratophylla, Br.	—	—	—	—	—	—	N.A.	—
,, longiloba, F. M.	—	—	—	—	—	—	N.A.	—
,, Leucodendron, Cunn.	—	—	—	—	—	—	N.A.	—
,, Crysodendron, Br.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, Sturtii, Br.	—	—	—	—	—	—	—	C.A.
,, polystachya, Br.	—	—	—	—	—	Q.L.	N.A.	—
,, striata, Br.	—	—	—	—	—	Q.L.	N.A.	C.A.
,, lineata, Br.	—	—	—	—	—	—	—	C.A.
,, mimosoides, Br.	—	—	—	—	—	—	N.A.	C.A.
,, Hillii, F. M.	—	—	—	—	—	Q.L.	—	—
,, Bleasdalii, F. M.	—	—	—	—	—	Q.L.	—	—
,, diversifolia, Meissn.	W.A.	—	—	—	—	—	—	—
Hakea lorea, Br.	—	—	—	—	—	—	N.A.	C.A.
,, longifolia, Cunn.	—	—	—	—	—	—	N.A.	—
,, stricta, F. M.	—	S.A.	—	V.	N.S.W.	—	—	—
,, saligna, Kn. and Sal.	—	—	—	—	N.S.W.	—	—	—
,, eriantha, Br.	—	—	—	V.	N.S.W.	—	—	—
,, arborescens, Br.	—	—	—	—	—	—	N.A.	—
,, eucalyptoides, Meissn.	W.A.	—	—	—	—	—	—	—
Xylomelum Scottianum, F. M.	—	—	—	—	—	Q.L.	—	—
,, pyriforme, Sm.	—	—	—	—	N.S.W.	—	—	—
,, occidentale, Br.	W.A.	—	—	—	—	—	—	—
Helicia ternifolia, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, glabriflora, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Youngiana, Moore and Muell.	—	—	—	—	N.S.W.	Q.L.	—	—
,, conjunctiflora, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, prælta, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, ferruginea, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
Orites excelsa, Br.	—	—	—	—	N.S.W.	Q.L.	—	—
Telopea oreades, F. M.	—	—	—	V.	—	—	—	—
Cardwellia sublimis, F. M.	—	—	—	—	—	Q.L.	—	—
Lomatia Fraseri, Br.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, polymorpha, Br.	—	—	T.	—	—	—	—	—
Stenocarpus sinuosus, Endl.	—	—	—	—	N.S.W.	Q.L.	—	—
,, salignus, Br.	—	—	—	—	N.S.W.	Q.L.	—	—
,, acacioides, F. M.	—	—	—	—	—	—	N.A.	—
,, concolor, F. M.	—	—	—	—	—	Q.L.	—	—
Banksia Cunninghami, Sieb.	—	—	—	V.	N.S.W.	—	—	—
,, ericifolia, L. Fil.	—	—	—	—	N.S.W.	—	—	—
,, litoralis, Br.	W.A.	—	—	—	—	—	—	—
,, cylindrostachya, Lindl.	W.A.	—	—	—	—	—	—	—
,, Australis, Br.	—	S.A.	T.	V.	N.S.W.	—	—	—
,, integrifolia, L. Fil.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, verticillata, Br.	W.A.	—	—	—	—	—	—	—
,, attenuata, Br.	W.A.	—	—	—	—	—	—	—
,, elatior, Br.	—	—	—	—	—	Q.L.	—	—
,, prionotes, Lindl.	W.A.	—	—	—	—	—	—	—
,, Menziesii, Br.	W.A.	—	—	—	—	—	—	—
,, serrata, L. Fil.	—	—	T.	V.	N.S.W.	—	—	—
,, dentata, L. fil.	—	—	—	—	—	Q.L.	N.A.	—
,, Solandri, Br.	W.A.	—	—	—	—	—	—	—

Banksia grandis, Willd.	W.A.	—	—	—	—	—	—	—
,, Victoriæ, Meissn.	W.A.	—	—	—	—	—	—	—
,, elegans, Meissn.	W.A.	—	—	—	—	—	—	—
,, Brownii, Baxt.	W.A.	—	—	—	—	—	—	—
,, ilicifolia, Br.	W.A.	—	—	—	—	—	—	—

COMPOSITÆ.

Aster argophyllus, Lab.	—	—	T.	V.	N.S.W.	—	—	—
,, stellulatus, Lab.	—	—	T.	V.	N.S.W.	Q.L.	—	—
Senecio Bedfordii, F. M.	—	—	T.	V.	N.S.W.	—	—	—

STYRACEÆ.

Symplocos Thwaitesii, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Stawellii, F. M.	—	—	—	—	—	Q.L.	—	—

ERICEÆ.

Prionotes cerinthoides, Br.	—	—	T.	—	—	—	—	—
Richea pandanifolia, J. Hook.	—	—	T.	—	—	—	—	—
Epacris heteronema, Lab.	—	—	T.	—	—	—	—	—
Cystanthe procera, F. M.	—	—	T.	—	—	—	—	—
Leucopogon Richei, Br.	W.A.	S.A.	T.	V.	N.S.W.	Q.L.	—	—
Monotoca elliptica, Br.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, lineata, Br.	—	—	T.	V.	—	—	—	—
Trochocarpa laurina, Br.	—	—	—	—	N.S.W.	Q.L.	—	—

MYRSINEÆ.

Aegiceras fragrans, Kœnig	—	—	—	—	N.S.W.	Q.L.	N.A.	—
Myrsine variabilis, Br.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, porosa, F. M.	—	—	—	—	—	Q.L.	—	—
,, subsessilis, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
Ardisia pseudo-jambosa, F. M.	—	—	—	—	—	Q.L.	—	—
Mæsa dependens, F. M.	—	—	—	—	—	Q.L.	—	—
,, haplobotrys, F.M.	—	—	—	—	—	Q.L.	—	—

SAPOTEÆ.

Sersalisia cotinifolia, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, sericea, Br.	—	—	—	—	—	Q.L.	N.A.	—
,, obovata, Br.	—	—	—	—	—	Q.L.	—	—
Achras Australis, Br.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Pohlmaniana, F. M.	—	—	—	—	—	Q.L.	—	—
Mimusops parvifolia, Br.	—	—	—	—	—	Q.L.	N.A.	—
,, kauki, L.	—	—	—	—	—	Q.L.	—	—

EBENACEÆ.

Diospyros rugosula, Br.	—	—	—	—	—	—	N.A.	—
,, mabacea, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, megalocarpa, F. M.	—	—	—	—	—	—	N.A.	—
,, fasciculosa, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, cupulosa, F. M.	—	—	—	—	—	Q.L.	—	—
,, sericocarpa, F. M.	—	—	—	—	—	Q.L.	—	—
,, Cargillia, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, pentamera, Woolls and Muell.	—	—	—	—	N.S.W.	Q.L.	—	—
,, humilis, F. M.	—	—	—	—	—	Q.L.	N.A.	—
,, geminata, F. M.	—	—	—	—	—	Q.L.	—	—

OLEACEÆ.

Olea paniculata, Br.	—	—	—	—	N.S.W.	Q.L.	—	—
Chionanthus axillaris, Br.	—	—	—	—	—	Q.L.	—	—
Notelæa ligustrina, Vent.	—	—	T.	V.	N.S.W.	—	—	—

VERBENACEÆ.

Clerodendron tomentosum, Br.	—	—	—	—	N.S.W.	Q.L.	—	—
,, lanceolatum, F. M.	—	—	—	—	—	—	N.A.	—
Vitex trifolia, L.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, acuminata, Br.	—	—	—	—	—	Q.L.	—	—
,, lignum vitæ, Cunn.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Leichhardtii, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, macrophylla, Br.	—	—	—	—	—	Q.L.	—	—
,, melicopea, F. M.	—	—	—	—	—	Q.L.	—	—
,, glabrata, Br.	—	—	—	—	—	Q.L.	—	—
Faradaya splendida, F. M.	—	—	—	—	—	Q.L.	—	—
Premna acuminata, Br.	—	—	—	—	—	—	N.A.	—
,, Tracyana, F. M.	—	—	—	—	—	Q.L.	—	—
Avicennia officinalis, L.	W.A.	S.A.	—	V.	N.S.W.	Q.L.	N.A.	—
Myoporum insulare, Br.	—	S.A.	T.	V.	N.S.W.	—	—	—
,, platycarpum, Br.	—	S.A.	—	V.	N.S.W.	—	—	—
,, Cunninghami, Benth.	—	S.A.	—	V.	N.S.W.	—	—	—
Eremophila bignoniflora, F. M.	—	—	—	V.	N.S.W.	Q.L.	—	C.A.
,, Mitchellii, Benth.	—	—	—	—	N.S.W.	Q.L.	—	C.A.
,, alternifolia, Br.	—	S.A.	—	V.	N.S.W.	—	—	—
,, oppositifolia, Br.	—	S.A.	—	V.	N.S.W.	—	—	—
,, longifolia, F. M.	W.A.	S.A.	—	V.	N.S.W.	Q.L.	—	C.A.

LABIATÆ.

Prostanthera lasianthos, Lab.	—	—	T.	V.	N.S.W.	—	—	—

ASPERIFOLIÆ.

Ehretia saligna, Br.	—	—	—	—	—	—	N.A.	—
,, acuminata, Br.	—	—	—	—	N.S.W.	Q.L.	—	—
,, membranifolia, Br.	—	—	—	—	—	Q.L.	—	—
,, pilosula, F. M.	—	—	—	—	—	Q.L.	—	—
Cordia dichotoma, Forst.	—	—	—	—	—	Q.L.	N.A.	—

ACANTHACEÆ.

Earlia excelsa, F. M.	—	—	—	—	—	Q.L.	—	—

BIGNONIACEÆ.

Diplanthera tetraphylla, Banks & Sol.	—	—	—	—	—	Q.L.	—	—
Dolichandra heterophylla, Fenzl.	—	—	—	—	—	Q.L.	N.A.	—
,, filiformis, Fenzl.	—	—	—	—	—	—	N.A.	—

APOCYNEÆ.

Tabernæmontana orientalis, Br.	—	—	—	—	N.S.W.	Q.L.	—	—
Lactaria calocarpa, Hassk.	—	—	—	—	—	Q.L.	—	—
,, Moorei, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
Alstonia constricta, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, scholaris, Br.	—	—	—	—	—	Q.L.	—	—
,, ophioxyloides, F. M.	—	—	—	—	—	Q.L.	N.A.	—
Wrightia pubescens, Br.	—	—	—	—	—	—	N.A.	—
Balfouria saligna, Br.	—	—	—	—	—	Q.L.	N.A.	C.A.

LOGANIACEÆ.

Geniostoma Australianum, F. M.	—	—	—	—	—	Q.L.	—	—

SOLANEÆ.

Duboisia myoporoides, Br.	—	—	—	—	N.S.W.	Q.L.	—	—
Solanum verbascifolium, L.	—	—	—	—	N.S.W.	Q.L.	—	—

III.—Amentaceæ.

Casuarinæ.

Casuarina glauca, Sieb.	—	S.A.	—	V.	N.S.W.	—	—	—
,, obesa, Miq.	W.A.	—	—	—	—	—	—	—
,, torulosa, Ait.	—	—	—	—	N.S.W.	—	—	—
,, quadrivalvis, Lab.	—	S.A.	T.	V.	N.S.W.	—	—	—
,, Cunninghami, Miq.	—	—	—	—	N.S.W.	—	—	—
,, Huegeliana, Miq.	W.A.	—	—	—	—	—	—	—
,, trichodonta, Miq.	W.A.	—	—	—	—	—	—	—
,, suberosa, Otto and Dietr. ...	—	S.A.	—	V.	N.S.W.	—	—	—
,, equisetifolia, Forst.	—	—	—	—	N.S.W.	Q.L.	N.A.	—
,, leptoclada, Miq.	—	—	—	V.	N.S.W.	—	—	—
,, thujoides, Miq.	W.A.	—	—	—	—	—	—	—
,, Decaisneana, F. M.	—	—	—	—	—	—	—	C.A.
,, tenuissima, Sieb.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, Drummondii, Miq.	W.A.	—	—	—	—	—	—	—
,, microstachya, Miq.	W.A.	—	—	—	—	—	—	—

Cupuliferæ.

Fagus Cunninghami, Hook. ...	—	—	T.	V.	—	—	—	—
,, Gunnii, J. Hook.	—	—	T.	—	—	—	—	—
,, Moorei, F. M.	—	—	—	—	N.S.W.	—	—	—

Coniferæ.

Araucaria Cunninghami, Ait. ...	—	—	—	—	N.S.W.	Q.L.	—	—
,, Bidwilli, Hook.	—	—	—	—	—	Q.L.	—	—
,, Greyi, F. M.	—	—	—	—	—	—	N.A.	—
Athrotaxis cupressoides, Don. ...	—	—	T.	—	—	—	—	—
,, selaginoides, Don.	—	—	T.	—	—	—	—	—
Callitris Macleayana, F. M. ...	—	—	—	—	N.S.W.	—	—	—
,, Parlatorei, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Actinostrobus, F. M. ...	W.A.	—	—	—	—	—	—	—
,, cupressiformis, Vent. ...	—	—	T.	V.	N.S.W.	—	—	—
,, columellaris, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Endlicheri, Parl.	—	—	—	V.	N.S.W.	Q.L.	—	—
,, Gunnii, J. Hook.	—	—	T.	—	N.S.W.	—	—	—
,, verrucosa, Br.	W.A.	S.A.	T.	V.	N.S.W.	Q.L.	N.A.	C.A.
Dacrydium Franklinii, J. Hook. ...	—	—	T.	—	—	—	—	—
Podocarpus elata, Br.	—	—	—	—	N.S.W.	Q.L.	—	—
,, Drouyniana, F. M.	W.A.	—	—	—	—	—	—	—
,, spinulosa, Br.	—	—	—	—	N.S.W.	—	—	—
,, alpina, Br.	—	—	T.	V.	N.S.W.	—	—	—
Phyllocladus rhomboidalis, Rich. ...	—	—	T.	—	—	—	—	—
Ephedra arborea, F. M.	—	—	—	—	—	Q.L.	N.A.	—

Cycadeæ.

Zamia Fraseri, Miq.	W.A.	—	—	—	—	—	—	—
,, Denisonii, F. M.	—	—	—	—	N.S.W.	Q.L.	—	—
Cycas media, Br.	—	—	—	—	—	Q.L.	—	—

MONOCOTYLEDONEÆ.

Pandaneæ.

Pandanus pedunculatus, Br. ..	—	—	—	—	N.S.W.	Q.L.	—	—
,, spiralis, Br.	—	—	—	—	—	—	N.A.	—
,, aquaticus. F.M.	—	—	—	—	—	—	N.A.	—

Kingiaceæ.

Kingia Australis, Br.	W.A.	—	—	—	—	—	—	—

PALMÆ.

Cocos nucifera, L.	—	—	—	—	—	Q.L.	—	—
Caryota urens, L.	—	—	—	—	—	Q.L.	N.A.	—
Ptychosperma Seaforthia, Miq. ...	—	—	—	—	N.S.W.	Q.L.	—	—
,, Alexandræ, F.M.	—	—	—	—	—	Q.L.	—	—
Livistona Australis, Mart. ...	—	—	—	V.	N.S.W.	Q.L.	—	—
,, inermis, Br.	—	—	—	—	—	—	N.A.	—

ACOTYLEDONEÆ.

FILICES.

Alsophila Leichhardtii, F. M. ...	—	—	—	—	N.S.W.	—	—	—
,, Australis, Br.	—	—	T.	V.	N.S.W.	Q.L.	—	—
Cyathea medullaris, Sm.	—	—	—	V.	—	—	—	—
,, Lindsayana, Hook.	—	—	—	—	—	Q.L.	—	—
Dicksonica antarctica, Lab. ...	—	S.A.	T.	V.	N.S.W.	Q.L.	—	—

The monocotyledonous and acotyledonous trees, not actually furnishing timber for ordinary purposes, might have been excluded. Gomphandra Australiana, F.M., among Oleoineæ, from Queensland, was casually omitted.

INTERCOLONIAL EXHIBITION ESSAYS, 1866-67.

No. 6.

ESSAY

ON THE

AGRICULTURAL RESOURCES OF VICTORIA.

ISSUED BY THE BOARD OF AGRICULTURE.

ON THE

AGRICULTURAL RESOURCES OF VICTORIA.

BEFORE proceeding to review the development of the vast resources of Victoria as an agricultural country, it may not be without interest to recapitulate a few statistical notes obtained from official returns *(vide* Mr. C. G. Duffy's *Guide to the Land Law of Victoria)*, giving the area of the country, its general qualification for agricultural and other similar purposes, and the extent to which settlement and cultivation have now reached.

Of the 55,644,160 acres in Victoria, about 12,287,000—comprising mountain ranges, land covered with mallee and other scrubs, swamps, &c.—are not directly available without expenditure of capital in improvements or reclamation. There are accordingly about 43½ million acres available for pastoral or agricultural purposes. In this extensive area there is, as may naturally be supposed, a great diversity of soil, depending upon the prevailing geological formation in each locality. The following table, prepared by the Government Geologist, shows the general character of the prevailing soils, and the districts in which they occur :—

TABLE I.

Rock Formation and Geological Age.	Approximate Area in square miles.	General Characters of Soil.	Physical Aspect of Country.	Locality.
I.—Clay, sand, lime, gravel, tertiary, & superficial deposits, including alluvial.	36,000	Rich light loam on alluvial flats, and also where mixed with lime, sea-shells, and vegetable matter.	Terraced flats along river valleys, open, or lightly timbered with red gum, blackwood, &c.	Generally distributed in narrow belts near the coast.
			Extensive level plains, with patches, &c., belts of stunted timber, or flat forest country; thinly grassed, undulating, generally sandy country clothed with heath, grass-tree, and scrub.	Chiefly in N.W. and S.E. districts.
II. — Clay slate, schists, and sandstone. Palæozoic (upper and lower silurian).	28,000	The greater portion cold sandy clays and poor light sandy loams.	Hilly and undulating country, timbered with iron-bark and stringy-bark.	Generally throughout the Central, N., N.E., and S.E. portions of the country.

TABLE I.—*continued.*

Rocky Formation and Geological Age.	Approximate Area in square miles.	General Characters of Soil.	Physical Aspect of Country.	Locality.
III.—Volcanic (lava, basalt, ash, &c.). Tertiary.	12,000	Rich black & chocolate-coloured soils, very fertile.	Open, slightly undulating plains, with isolated wooded hills, generally lightly timbered, often stony.	South-Western & Central districts.
IV.—Granite.	8,000	Light and sandy.	Openly timbered, undulating, and hilly, generally well grassed. Also densely timbered mountain ranges extending to 4000 feet above the sea level.	In timbered patches throughout the country, except the S.W. and N.W. districts.
V.—Shales and soft sandstones, mesozoic (carbonaceous).	3,000	Rich sandy loams.	Open, well-grassed downs, and hilly country, with dense forests.	Barrabool Hills, portions of the Counties of Normanby & Dundas, also of South Grenville & Polwarth, and between Western Port Bay and Corner Inlet.

As regards the relative adaptability of the different classes of soil for the cultivation of grain and other crops, it is found that they rank in the following order :—

1. Alluvial soils and black vegetable moulds. Gippsland, Western Port, Warrnambool, and Colac are the districts in which these exceedingly rich deposits prevail, and the large returns obtained by farmers in these localities clearly show the value of such soils.

2. Volcanic soils, black or chocolate coloured. These occur in many parts of the colony, in which some of the best and most productive farms are situated. They are almost, if not quite, as fertile as those mentioned first, are much prized for vineyards, and are also very well adapted for general cultivation.

3. The porous loams found on the mesozoic or carboniferous rock formation. Soils of this class are generally more or less enriched by organic matter, and produce excellent crops, as for instance on the Barrabool Hills, near Geelong, and in the counties of Normanby, Dundas, Polwarth, and Grenville.

4. A tolerably good soil, though rather light and sandy, is found in limited patches throughout the country, formed by the decomposition of granite.

5. The clays and tenacious loams, and soils in which sand predominates, although rather unproductive in their crude state, produce fair crops in winter and early spring, if manured.

The total area under occupation for other than pastoral purposes on 31st March, 1866, was *(vide Statistics of the Colony of Victoria)* 6,785,225 acres, distributed in 20,063 holdings exceeding one acre each, 5,181,332 acres purchased and the remainder rented from the Crown. 5,357,962 acres were enclosed at the time mentioned ; and of this, 530,196 acres were under tillage. The total area under occupation in 1867 was 7,324,396 acres, distributed in 23,170 holdings ; of this area 5,348,206 acres are purchased, 1,109,621 acres rented, and 614,995 under tillage.

Victoria may be divided into climatically well defined districts, each of which is more or less suited for the cultivation of different crops.

Of these, the large extent of country south of the Main Dividing Range and west of Port Phillip Bay stands first in importance, not only on account of its extent, but also because it contains large areas of the richest and best soils. Grain and root crops of all kinds thrive admirably in every part of it; and the cultivation of the vine, which was first established in this district, has so greatly advanced that the production of wine now forms a not unimportant item.

Less extensive, though scarcely less important to the agriculturist, is the district east of Port Phillip Bay and south of the Dividing Range. Though this district, excepting perhaps portions of it near the shores of Port Phillip Bay, has only been occupied by farmers within comparatively the last few years, it seems nevertheless certain that before many years are over the rich alluvial soils so common in most parts of it will produce abundant harvests of the usual field crops; whilst advantage might be taken of the humid atmosphere and fertile soils of many valleys sheltered by lofty ranges for the cultivation of plants such as cinchona, tea, coffee, &c.

The third great area comprises the land south of the Murray and north of the Dividing Range. The comparatively dry atmosphere and the greater heat which prevails here make this tract of country less adapted for agriculture (so far at least as the usual field crops are concerned) than either of the preceding ones, though excellent harvests have been obtained in some localities. But the cultivation of the vine has for some time been successfully carried on, and is spreading now to remote districts—indeed our most magnificent crops of wine grapes are obtained from the north. Cotton and other plants of a warmer clime have been cultivated, not without success, although as yet only on a small scale.

Until within the last few years farmers paid attention almost exclusively to the cultivation of such crops as are generally raised in Middle European countries; and even now, although it has been proved beyond doubt that others will succeed in Victoria, and in many cases yield far more remunerative returns than the ordinary ones, they do not receive that general attention they deserve.

References on this subject will also be found in the report on the resources of the colony, issued by the Royal Society of Victoria in 1860.

Wheat, barley, and oats, the latter cultivated for hay as well as grain, form the staple products of our farmers. Potatoes, rye, peas, beans, maize, sorghum, and especially mangold-wurtzel and beet, rank next in importance; whilst the cultivation of clovers and various fodder grasses (amongst which the exceedingly prolific prairie-grass deserves to be especially noticed) is becoming daily more general. Vineyards and orchards form an important item and occupy a considerable portion of the ground under cultivation. Tobacco may now also be included amongst the important Victorian agricultural products. Rather numerous, and in most cases very successful, experiments have been made in the cultivation of hemp, flax, hops, chicory, sugar-beet, canary-grass, arrowroot, and other plants of economic value, and there is reason to believe will before long take their rank amongst the products of husbandry in Victoria.

In our orchards, which in March, 1866, comprised 3449 acres, we have not merely the best varieties of the usual Middle European fruit-trees, which rather improve than deteriorate in our climate, but also olives, oranges,

guavas, black mulberries, loquats, and other fruits which in the British climate require more or less protection during some portion of the year. Of olives we possess some of the best varieties. The climate leaves nothing to be desired as regards their growth for oil, and therefore landed proprietors may reasonably anticipate a fair return for investments in this branch of agriculture.

The importance of the white mulberry for sericulture is annually becoming more recognised, and its cultivation spreading with proportionate rapidity. Thus silk-culture may prove in future years a source of lucrative employment to the juvenile and infirm of the labouring classes, as it now is in France, Italy, and other silk-producing countries.

The Government Botanist has lately drawn attention to the probability of the cinchonas, tea and coffee plants, succeeding in our fern-tree gullies, where irrigation can be readily applied, and where, until carriage is cheaper, only costly products would realise a profit.

Experiments are now being made to test the practicability of forming larger plantations of these in the mild, damp, and sheltered districts in the mountains, which, if successful, will open entirely new branches of industry in Victoria.

It may be mentioned that farms devoted to the culture of medicinal and cosmetic herbs, from which the essential oils are extracted on the spot, have also been established with success.

Having thus briefly reviewed the principal plants to which our farmers have paid more or less attention, the following tabular statements from the returns issued from the Registrar-General's office are quoted. These data show the quantity of land devoted to each of the principal crops, and the produce obtained in 1865. Similar returns for some of the preceding years have been added, in order to compare the gradual progress of agriculture.

TABLE II.

YEAR.	Wheat.	Barley.	Oats.	Hay.	Other Cereals.	Potatoes.	Other Green Crops.	Green Forage.	Tobacco.	Vines.	Other Crops.	Gardens and Orchards.	Fallow.
	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acrs.	acres.	acres.	acres.	acres.
1860...	161,251	4,123	86,387	90,920	2,423	24,841	2,257	17,660	91	1,138	579	7,298	20,457
1861...	196,922	3,419	91,061	74,681	2,476	27,174	1,423	16,692	220	1,464	582	6,946	16,835
1862...	162,008	6,829	108,195	101,639	2,659	24,820	1,593	28,712	508	2,006	390	7,724	18,341
1863...	149,392	7,595	152,326	96,350	2,893	27,584	1,371	35,342	623	3,076	546	8,282	22,218
1864...	125,040	7,648	144,303	85,146	3,799	31,172	1,415	40,061	524	3,594	1,384	8,988	26,389
1865...	178,628	6,887	102,817	97,902	5,130	31,644	1,850	55,830	397	4,078	1,888	10,103	33 042
1866...	226,826	8,435	134,472	...	...	35,970	...	...	216	...	...	...	33,990

TABLE III.—TOTAL PRODUCE RAISED FROM THE ABOVE QUANTITY OF LAND UNDER TILLAGE.

YEAR.	Wheat.	Barley.	Oats.	Hay.	Other Cereals.	Potatoes.	Other Green Crops.	Tobacco.
	bushels.	bushels.	bushels.	tons.	bushels.	tons.	tons.	cwt.
1860	3,459,914	83,854	2,633,693	144,211	38,738	77,258	19,851	1,257
1861	3,607,727	68,118	2,136,430	92,479	33,083	59,364	9,938	2,552
1862	3,008,487	143,056	2,504,301	110,680	38,977	50,597	13,855	4.324
1863	1,338,762	130,664	3.497,520	121,840	53,413	74,947	14,129	5,913
1864	1,899,371	124,849	2,694.415	97,740	50,668	59,825	8,657	3,450
1865	3,514,227	153,490	2,279,468	96.101	73,390	83,166	15,068	3,328
1866	5,216,336	233,903	4,209,303	...	...	95,614	...	2,018

In calculating from these tables the average yields per acre of some of the main crops in each year, a great difference will be found to exist. This, however, can be readily accounted for by a number of mishaps, some at least within the control of the farmers themselves. Several successive unfavourable seasons, extensive spreading of rust amongst cereals, and their occasional or partial destruction by wire and other worms, or by the microscopic parasites causing the root blight, have combined to render farming occasionally a somewhat precarious pursuit, especially in those cases where the locality was ill chosen, the soil subjected to exhaustive cropping, and draining and many other tilling operations imperfectly carried out. Improved methods of farming are likely to cause the gradual decrease of the plagues named, and to produce as a general rule more favourable results; so that, even in seasons of great drought, like that of the preceding year, excellent harvests may be obtained in carefully selected spots; more especially as it is fully understood that dry seasons cause the annihilation of rust.

The average returns for each year, for the whole extent of country, is given in the following table, calculated from Mr. Archer's Statistics:—

AVERAGE YIELDS PER ACRE FROM 1860 TO 1865.

YEAR.	Wheat.	Barley.	Oats.	Hay.	Potatoes.
	Bushels.	Bushels.	Bushels.	Cwt.	Cwt.
1860	21½	20½	20¼	22	62
1861	13	Nearly 20	22[illegible]	24⅓	43⅔
1862	16¼	[illegible]	23	21⅔	40⅔
1863	9¾	17	23	25	54
1864	15⅓	17⅔	18	23	36
1865	19	22	22	20	53
Almost	[illegible]	27⅓	...	...	53

The above returns must appear to any one not accustomed to Australian farming exceedingly small, as compared with those of Great Britain. Here, however, as in most newly-settled countries, systematic and scientific farming, as practised in long-settled communities where ground is proportionately valuable and limited, has been and still is the exception. The same field has often been forced to produce a similar crop for a number of years, until the soil—which was but rarely sufficiently stimulated or fertilised by manure, or renewed by deep cultivation—becomes thoroughly exhausted, and unfit to yield any remunerative crop. Notwithstanding these circumstances there are many comparatively excellent returns on record; thus for the year 1859, in the district of Gisborne, thirty-five bushels of wheat, fifty bushels of barley, and fifty-five bushels of oats, are given as the maximum average yields per acre; whilst in the Melbourne, Villiers, and Heytesbury districts six tons of potatoes per acre were harvested. For hay, Kyneton, Burrumbeet, and Lake Learmonth districts carry off the palm; each of these averaged three and a half tons per acre.*

The circumstances of the country still render an inexpensive system of farming in a great measure necessary; and it is only natural to suppose that the farmer will adopt for the time such operations as will be immediately lucrative. Considering the large area of unsold lands in the colony at the present time suitable for agricultural purposes, and knowing that

* See Archer's Statistics, *page* 18.

such lands can be purchased and brought under tillage more advantageously than renovating the exhausted land, it is not to be expected that such farms will be improved. Exhausted farms are generally made available for grazing purposes. The advantages of a different and better system are, however, fully recognised, and we may safely predict that husbandry will fairly keep pace with the general progress of the colony.

The steam plough has been introduced, and has been used in some localities, more especially for subsoil ploughing and trenching land intended for vineyards. The value of deep cultivation for cereals and root crops (so clearly demonstrated by chemical science) is also well known to farmers, and the importance of its introduction cannot be over-estimated. There are many difficulties incurred in working the steam plough in Victoria at the present time, caused by the crude and inefficient manner in which the land has been cleared of its timber, stones, &c., when first broken up, whereby the machinery is frequently damaged, and this necessarily caused an increased expense of ploughing. This has been one of the principal reasons why the steam plough has not been more generally used, as it is found that animal labour is still less expensive and more applicable, as well as more within the means of the general farmer.

The difficulties consequent upon cultivation in a young country will disappear in course of time, and it is presumed that the advantages of the steam plough will ultimately lead to its adoption and more general use wherever practicable.

Amongst other improvements carried out on many of the larger and better managed farms, a general system of drainage, and, in some instances, of irrigation, must be mentioned. Both are of the greatest importance to Australian agriculturists.

The quantity of rain which falls in Victoria is, on the whole, but little less than that observed in many of the European countries; but whilst there it is more equally distributed over the whole year, in Australia there is a superabundance of moisture during the winter and early spring months, and frequently afterwards through the summer and autumn scarcely any rain falls nor dew sets in. Cereals and other field crops are thus apt to suffer during their first stages of development on undrained and especially flat land, and being so much checked in their growth, have but little chance of recovering in time for the vigorous formation of halms and ears before or during the hotter season. Wherever practicable, a thorough system of irrigation should be combined with efficient drainage. The results of irrigating any growing crops during the hot season of the year are really astonishing. Three cuttings of hay have been obtained by these means from a field in the Dandenong district, sown with rye grass; and, judging from appearances in January last, one or two more may be expected to be taken from it. Maize, sorghum, and other similar plants cultivated for green food, derive equal advantages from irrigation; it is ascertained (*vide Australasian*, September 1, 1866) that on the Experimental Farm, on a plot planted with maize, the latter had grown, within seventeen days from the time the water had been turned on, from 1 foot 6 inches to 4 feet 6 inches and 5 feet. We firmly believe that many other facts, showing equally rapid development, could be adduced if more extensive data on this point were collected; and therefore we may hope that shortly irrigation will become less an exception than hitherto. The extensive reservoirs now being formed by the Government will afford great facilities

for bringing this system into more general use, beyond its primary object for mining purposes. It will doubtless prove of the greatest national importance, and if efficiently carried out will render the farmer almost independent of the seasons.

Another point to which more attention should be paid by every rational farmer is the adoption of a regular rotation of crops; and from the necessary investigations as to the adaptability of any particular soil to the crop it has to produce, he will learn what special ingredients necessary for the full development of the plant may be wanting in the soil, and which accordingly have to be supplied as organic or mineral manures. Fertilisers of various kinds can be readily enough obtained, and are of late much more used than formerly; and as there is no limit to the supply, the constantly increasing demand can be readily met. Extensive deposits of guanos, which are richer in phosphates than those from the American coast, and, therefore, more nutritive to vegetation, are to be found on islands on the Australian coast, and can be obtained at a price low enough to bring them into general remunerative use. The sewage and offal from towns, which, by the simple process of deodorisation, can now be rendered readily available, is easily transferable to farming grounds.

In order to give some idea of the enterprise and progressive spirit of our agriculturists, the following return is given (obtained, like the others quoted, from Mr. Archer's published statistical tables) of the numerous agricultural machines and implements which during the past year have been in use in Victoria. The majority are imported, but, nevertheless, we are indebted to Australian industry for many valuable improvements, and even some exceedingly useful new inventions, especially in reaping and threshing machines, which have gained reputation beyond the limits of Australia.

Agricultural Machines and Implements in Use in Victoria in the Year ending March 31st, 1866.

Chaff Cutters	2,424	Ploughs	14,995
Cultivators	37	Reaping Machines	1,890
Grubbers	65	Seed Drills	66
Hay Elevators	14	Threshing Machines	623
Hay Rakes (Horse)	374	Wine Presses	104
Horse Hoes	123	Winnowing Machines	883
Horse Works	723	Grape Mills	12
Irrigating Works	15	Cheese Presses	25
Mowing Machines	83		

Having now briefly reviewed the general aspect of agriculture, we proceed to glance at the principal crops obtained by our farmers. Wheat ranks naturally first, and although we have not hitherto produced the quantity required for our population, it is very probable that this desirable object will be shortly attained. The rich basaltic soils which are known to be extensive in this colony, and also the fertile alluvial ground common in the neighbourhood of rivers, &c., have shown themselves to be admirably adapted for the culture of this grain. Fair crops may likewise be realised from rather clayey loamy soils, provided they have been properly worked. In the climate of Victoria it is of the greatest importance, in the culture of wheat and most other grain crops, to sow the seed as early as possible before the autumnal genial warmth has left the soil. By this course the young plants are well established before the cold winter rains set in.

Fields treated like this not only furnish a better crop in regard to quantity, but it has also been observed that late-sown plants are generally more readily and severely attacked by rust, &c.* The appearance of the latter and of blight, during several of the past years, caused such destruction amongst the wheat that many farmers preferred other crops less liable to suffer; and accordingly there is a gradual decrease, up to last year, in the quantity of land devoted to its cultivation, from 196,922 acres in 1861 to 125,040 acres in 1864, but a vast increase has again taken place this year. In 1865, 178,628 acres were under wheat, whilst the year 1866 shows a large increase on that quantity. The latest published statistics show that in the year ending March, 1867, 226,862 acres produced nearly five and one quarter million bushels of this grain. In the table given on page 7, the average yield per acre for the whole colony is shown. How great, however, is the variation between the maximum and minimum produce may be observed by the fact, that off 100 acres in the Ballarat district 3500 bushels have been harvested; and in many other localities —for instance, Smeaton, Mount Franklin, Pentland Hills, &c.—the yields were in many cases 40 bushels (45 to 60 bushels have, however, been obtained in exceptional cases), whilst only 10 bushels were got from land which had produced the same crop for a number of years. The quality of Victorian wheat is excellent, the weight per bushel generally ranging between 65 and 66 lbs.; some has been exhibited weighing 69 lbs. 4 ozs. The sorts generally cultivated in Victoria are white Tuscan, purple straw, white Lammas, white velvet, and other well-known varieties.

Hallet's celebrated Pedigree Wheat has of late been successfully tried in various localities, and promises to become one of the favourite varieties, especially as it appears that it is less liable to be attacked by disease.

Some experiments have also been made by Mr. Martelli in the cultivation of that variety more particularly adapted for the manufacture of macaroni, &c.; also of the Leghorn and Lombardy variety, grown chiefly for the sake of the straw, which is used there for plaiting. Both kinds have shown themselves well adapted to our climate, which is generally similar to that of Italy.

Oats are almost of greater importance to the farmer than wheat. Oats, as a crop, may be considered less precarious than wheat, as it can be cut for hay, if thought preferable; the latter, especially near the centres of population, is generally found to be more remunerative.

The total quantity of land under oats in 1865 was 200,719 acres, employed in nearly equal portions for the above purposes. Especially near Melbourne and Geelong, many of the farmers have for a series of years been in the habit of annually cropping their fields with oats for hay (without even supplying the necessary manure), and it is stated that through exhaustion of soil the produce is reduced by one-half.

From thirty to forty cwt. may be fairly taken as the product of one acre of ground which has been properly worked, and not exhausted by previous crops; whilst in exceptional cases three or four tons, and it is said even up to six and a half tons, have been obtained (near Brighton). The latter quantity was harvested from a piece of land naturally rather poor, but enriched enormously by miscellaneous manurings.

* Refer on this subject, and others connected with rust in Australia, to the Report of the Board of Agriculture for 1865.

The following are the varieties of oats which are chiefly grown in Victoria, viz.:—Potato, Tartarian, black and white, and other varieties, but the potato is mostly cultivated.

The average yields of grain per acre, calculating them from the quantities raised throughout, have been given (page 7); far larger returns than those are, however, frequently obtained, and cases are not rare where from fifty to sixty bushels per acre have been harvested. The weight of the grain varies considerably, as might be expected, according to soil and climatical conditions of the various localities where it was grown. Samples have been exhibited at the exhibitions of grain and farm produce weighing from 43¾ lbs. to 48 lbs. per bushel.

Barley has not been very extensively cultivated for grain, but it thrives exceedingly well in localities possessing naturally rich soil, or on fields specially prepared for its culture. But little demand existed for it, as until the last few years almost the whole of the malt required was imported. Since, however, malt-houses have been established in Victoria a greater demand has sprung up, and accordingly, whilst in 1860 only 4123 acres were devoted to its growth, 6887 acres were occupied by it in 1865, which quantity had increased during the year ending March, 1867, to 8435 acres, from which 233,903 bushels grain were obtained.

During the summer season, the preparation of malt is here more precarious and difficult to accomplish than at home. Some excellent kinds of malt have, however, been repeatedly produced, and it is to be hoped that any remaining difficulties in its manufacture will be removed, so that colonial-made malt may eventually supersede the imported article. In former years, barley of the Cape variety was almost exclusively, and is still in a great degree, used for green fodder. For this purpose it is sown as early in autumn as possible, and at intervals until spring. The first rains that fall cause the seed to germinate, and favoured by the warm weather and occasional showers, the halms are rapidly developed, and afford an abundance of succulent food until the hay crop is obtained.

Amongst the varieties of barley cultivated here are the common English, Chevalier, Annatt, Cape, and Skinless. The best results in the culture of this grain have shown forty bushels to the acre. The grain thus obtained is plump and well filled; prize samples grown in the Kyneton district have been found to weigh 57½ lbs. per bushel.

Over a great portion of the north of Europe rye is cultivated very extensively, in fact more so than wheat, the place of which it takes. It had comparatively been neglected by Australian farmers till within the last few years. It is important to bear in mind that this hardy corn has excellent nutritive and wholesome properties. It is satisfied with an inferior class of soil, and is remarkably resistant to the ill effects of climate in exposed localities. The cooler mountain regions might be most advantageously chosen for its culture.

No grain seems better adapted for fields more or less exhausted in the older farming districts than this, and perhaps some pulses, if added to the course of crops now followed.

Rye yields not only an excellent green fodder (for which it has hitherto been chiefly used), but its grain gives a bread for which those accustomed to it have a great predilection. Rye bread, in the northern parts of Europe, forms the main food of the people. This grain is also largely used for the preparation of a pure strong spirit, which, like that obtained

from potatoes, enters thus into general consumption. Amongst other grain crops occasionally cultivated are maize, sorghum, and some other kinds of millet, and canary grass. The two former are the more important, and most attention has been given to their culture, although, except perhaps in the warmer parts of the colony towards its northern boundary, both are chiefly made use of as green fodder for horses and cattle. That the cultivation of maize can be successfully undertaken in Victoria also as a grain crop, is proved by the fact that, during the past season, 23,534 bushels (the yield of 1572 acres) were grown here ; by far the largest portion (1392 acres) was the produce of the Murray district. Their valuable qualities for fodder purposes can scarcely be over-estimated. The rich succulent stems and leaves, which are produced in abundance, especially by the different varieties of sorghum, at a season when green fodder of any other kind cannot easily be obtained, render this plant of great value to the dairyman, who by using it is enabled to get in good land far larger returns of milk, butter, and cheese than he otherwise could. For its well-known fattening properties it might probably be found advantageous to cultivate it still more largely as food for cattle intended for the butcher. Although a sufficient quantity of saccharine matter is contained in the juice pressed out of the stems, no attempt on a large scale has as yet been made to use it for the manufacture of sugar. The Government Botanist exhibited some sugar from sorghum at the Exhibition (1861) in Melbourne, and in London (1862). In the warm temperate parts of East Gippsland maize would undoubtedly give a most ample return of grain.

The smaller kinds of millet, canary grass, and other grain of less importance, have hitherto been grown experimentally only. Those named, and many others not yet tried, will probably succeed very well ; too little attention has been paid as yet to their culture, and a passing glance at them will be sufficient in this short review.

The cultivation of potatoes has been found somewhat uncertain in its results, except perhaps in some specially well situated localities, such as the neighbourhood of Warrnambool, the valley of the Yarra, and other similar spots of rich volcanic and alluvial or diluvial soil, where during the heat of summer sufficient moisture is retained to sustain the plant. In unfavourable spots the young plant, after having safely escaped injury from a late spring frost, may be prevented for want of rain either from setting the tubers or else they will remain small and unsaleable. Sudden heavy rains after Christmas are apt to induce the half-formed tubers to grow again, and thus they become unfit for market. Under these circumstances it is not surprising to find the crop varying more than any other.

From poorer and dryer localities between two and three tons per acre may be considered a fair return, whilst off the rich soils referred to, five to eight, and even as much as fourteen, tons (near Warrnambool) have been obtained. In localities like the latter the tubers sometimes attain an enormous size, occasionally averaging two and three pounds each. A specimen grown near Daylesford, which was modelled for the Exhibition, when first taken out of the ground weighed three pounds eight ounces, and larger ones were said to have been obtained from the same place. Amongst the many varieties the following are in the greatest favour amongst Victorian farmers, viz.:—Brown's River, Circular Head, Scotch Greys, Ash-leaved Kidneys, Flukes, Prince Regent, Pink Eyes, and many others.

New rich ground, which has not been broken up before, is generally used for the cultivation of potatoes, and large yields are obtained without manure. The set is merely covered by the sod being turned over it with the plough.

Peas and beans have come into more favour during the past few years. They are not only a remunerative field crop, and thrive well on less fertile soils and in exposed localities, but the former especially possesses the additional advantage of checking the rampant growth of sorrel—a weed which in many localities has spread to such an extent as to render necessary the temporary conversion of such land into pastures. Vetches, tares, gram, and other similar plants, though well adapted to our soil and climate, and valuable for feeding stock of any kind, are but rarely met with in Victoria, although their culture would doubtless be very profitable.

The various kinds of turnips, cabbages, rape, and other plants of the same class, are so subject to the attack of the aphidæ, all comprised under the vernacular name of blight, that their cultivation in some localities is almost impossible. The want of such an important plant as the first-named is, however, partly at least, compensated for by the facilities with which other root crops of equal or perhaps even greater importance may be grown. Mangolds and carrots stand first among these, and their luxuriance, if cultivated on suitable soil (the alluvial flats near rivers or creeks suit them best), is really astonishing.

It is reported that as much as thirty tons per acre have been obtained of mangolds, and proportionately large quantities of carrots. It would be useless to speak of the value of these roots for fattening stock, this being well known already. A new branch of industry has been established for converting the saccharine matter of mangolds and sugar beet into spirits, and it is likely that its operations will be extended to the manufacture of sugar from the latter.

Chicory is to some extent cultivated by some of the smaller farmers, who, it appears, find it more profitable to devote a little extra labour and attention to the preparation of the soil for this root, instead of cropping their lands in the usual way with cereals, &c.

Fodder plants of various kinds, such as English and other grasses, clovers, lucerne, &c., have had considerable attention of late, and have proved mostly very remunerative, either for improving the natural pastures or for hay or stall feeding, whilst in a fresh state.

Lucerne is one of the most important. It thrives admirably in moist fertile, and especially in calcareous soils, where sometimes from three to four cuttings may be taken from it during the year. For dry and almost sterile localities, such as the slopes of hills, &c., it can be safely recommended, as even there it affords a never-failing supply of nutritious green food, even at a season when the native grasses to a great extent are dried up.

Sainfoin has succeeded well in several localities, although this does not appear to have been generally the case. It is best adapted for those that are warm and dry, having a deep calcareous soil. For places like these it becomes invaluable. Sainfoin is reckoned amongst the most valuable fodder plants, and it possesses the additional advantage over other clovers that, although eaten in abundance in a green state, it produces none of the evil effects of swelling the cattle, &c., as observed with clover, lucerne, and some other green foods.

Of true clover, the dwarf white species appears to be the most useful. Sown on pastures by itself, or mixed with grasses, it soon gets established, and forms a thick sward, which even during the hottest summer does not entirely cease growing. The perennial red and the Dutch clover also thrive well, although their successful cultivation is not certain, and more dependent on soil, season, &c. The hop clover is also frequently grown. The white clover has disseminated itself extensively over considerable tracts of depressed country.

Amongst grasses, the so-called Californian prairie grass, or rather Quito prairie—*Bromus unioloides*, or *Bromus Schraderi*—ranks perhaps highest. Growing as it does with almost equal vigour on all kinds of soil, it seems to be scarcely affected by the extreme temperature both of our summers and winters, and affords accordingly throughout the year an abundant supply of feed, which may either be depastured or, what appears to be better, converted into hay.

Some halms of this exceedingly useful grass were exhibited a few months ago in Melbourne (from a farm on the Keilor Plains), which measured between five and six feet in height. Rye grass is extensively used by farmers for the improvement of pastures, and for hay, either by itself or mixed with other European grasses. Although it suffers to some extent during the hot season, it does not get so much burned up as the native grasses; nor does it die out, but commences to sprout again after the first showers. Pastures sown with the above, provided they are not destroyed by overstocking, will keep good for a great many years. A paddock towards Yearing, containing rye-grass sown twenty years ago, is reported to be still in excellent condition. The following are the other English grasses which are more or less in favour with Victorian farmers:—Meadow fox-tail, sweet vernal, cocksfoot, crested dogstail, woolley soft grass, Timothy grass, &c.*

The following remarks, offered by a gentleman well qualified to speak on the subject, a member of one of the oldest firms in the seed trade in Melbourne, were recently published in *Lindley's Gardener's Chronicle*:—

GRASSES FOR AUSTRALIA.

"I shall now proceed to advise your correspondent which I consider the grasses most suitable for the colonies, and will be glad to furnish him with any further information in my power. Prairie grass *(Bromus unioloides)* stands heat well, yields abundantly, and should form a prominent part of all mixtures for permanent pastures. Perennial rye-grass *(Lolium perenne)* is much used—stands well on any ordinary soil, either to graze or cut. Italian rye-grass *(Lolium italicum)* is used both to cut and graze, but does not stand drought so well as the perennial rye-grass; it is, however, a valuable grass in moist situations. Cocksfoot *(Dactylis glomerata)* stands well where other grasses are obtainable. Soft grass *(Holcus lanatus)* is a very desirable variety; it stands well, and stock will eat it greedily. Couch, or Indian dock-grass *(Cynodon Dactylon)*, is getting into favour of late years; it is a creeping grass, and of much value on dry sandy soils. Timothy, fescues, peas, dogstail, foxtail, sweet vernal, and rib-grass all stand tolerably well; but as they do not yield so heavy as the grasses first mentioned, they are but lightly used. Of clover the white, cowgrass, alsike, and trefoil stand well, and are used more or less in all pastures,

* Lindley's Gardener's Chronicle.

except where white is naturally in the land. All the above seeds can be had, of colonial growth, at prices only slightly in advance of English seedsmen, and one bushel of the colonial article may fairly be estimated as worth four or five bushels of imported seed. Machinery has been imported to this country for cleaning all sorts of seeds, and samples that would bear comparison with anything in this market are to be found in any respectable seed warehouse in the antipodes."

The same paper furnishes also a table which presents many interesting facts regarding the culture of fodder plants in England.

TABLE OF FACTS REGARDING FODDER PLANTS.

Botanical Name.	Soil preferred by it.	Weight per bushel.	Seeds per lb.	Proportion per acre sown in mixtures.	Time of flowering.
		Lbs.	No.	Lbs.	
Agrostis stolonifera ...	Moist places ...	13	8,000,000	1	May.
Alopecurus pratensis ...	Stiff soils	5	1,200,000	1 to 2	May.
Aira caespitosa	Moist moors ...	14	2,000,000	1	—
Anthoxanthum odoratum ...	Sands	8	1,100,000	2 to 3	April.
Arrhenatherum avenaceum	Dry gravels ...	7	320,000	4 to 5*	May.
Cynosurus cristatus ...	Lawns	26	440,000	6*	June.
Dactylis glomerata ...	Deep rich soils ...	12	600,000	3 to 6	May.
Elymus arenarius	Sea coasts	11	37,000	10*	—
Festuca duriuscula ...	Dry pastures ...	12	640,000	2 to 3	June.
,, elatior	Clays	14	320,000	2 to 4	June.
,, heterophylla ...	Adhesive soils ...	10	520,000	1 to 2	June.
,, ovina	Light soils	14	100,000	1 to 2	May.
,, pratensis	Moist soils	20	42,000	2 to 6	June.
,, rubra	Light dry soils ...	12	62,000	(?)	May.
Holcus lanatus	Moory soils ...	7	1,500,000	1*	July.
,, mollis	Light sands ...	6	130,000	4*	July.
Lolium perenne	All soils	18 to 30	240,000	10 to 12	June.
,, italicum	All soils	15 to 20	400,000	6	June.
Phleum pratense	Warm clays ...	44	1,200,000	2 to 4	June.
Poa nemoralis	Shaded woody spots	15	2,700,000	2 to 3	--
,, pratensis	Light and dry ...	13	3,800,000	2 to 3	June.
,, trivialis	... ...	15	3,400,000	2 to 3	June.
Psamma arenaria	Sea coast ...	15	160,000	8 to 10*	—
Trisetum flavescens ...	Dry, cool ...	5½	1,800,000	1	—
Achillea millefolium ...	... ...	30	3,000,000	1	—
Cichorium intybus	Loam	32	336,000	1 to 2	—
Lotus corniculatus	Dry places	62	500,000	½ to 1	—
,, major	Moist places ...	64	800,000	½ to 1	—
Medicago lupulina	Inferior soils ...	63	250,000	1 to 2	—
,, sativa	Calcareous loam ...	60	200,000	—	—
Onobrychis sativa	Chalky soils ...	26	21,000	—	—
Plantago lanceolata ...	... ...	50	250,000	—	—
Poterium Sanguisorba ...	Chalks	25	53,000	2 (?)	—
Trifolium hybridum ...	Loam	63	72,000	2 to 3	—
,, pratense ...	Loam	64	250,000	3 to 4	—
,, repens	Loam	65	512,000	2 to 4	--

The Grasses and other plants marked thus * are sown only under particular circumstances, or for special purposes.

The extent of land laid down with imported grasses was, on 30th March, 1866, according to official returns, 48,960 acres. More than one-half of this quantity, 24,880 acres, is in the counties of Bourke (8803 acres) and Villiers (16,077 acres).

During the past few years considerable attention has been paid to the cultivation of tobacco, which at one time appeared to increase with great

rapidity. Thus, whilst in 1859 fifty acres were devoted to the growth of this plant, in 1863 the area had been increased to 623 acres. A gradual decrease has, however, since taken place in the breadth of land occupied by this crop, reducing it to 397 acres in 1865. This seems to indicate that the profits arising from its culture are after all not so large as was at first anticipated. The causes of ill success are the large amount of manual labour required by the plant during its growth; ravages of hordes of caterpillars, which can only be kept under by constant attention to their destruction; the occasional severity of the seasons, which sometimes endanger the success of the plantations; and, above all, the fact that many undertook the culture of tobacco who had no experience of the best methods of cultivation, and especially of the treatment of the leaves after they have been harvested, so as to dry them properly and render them fit for market.

Information on the latter subjects has now become generally diffused, and as for many of the minor operations children can be employed, and the cost of its production may be considerably lessened, it is believed that it will yet form a not unimportant item amongst the various crops raised in Victoria. In suitable localities, having loose and deep fertile soils and an adequate climate, tobacco will succeed remarkably well; and gentlemen well conversant with the subject have pronounced the Victorian leaf excellent (when the result of careful cultivation), and that it only requires proper preparation and age to bring out its superior qualities. A large demand exists for native-grown tobacco for sheep-dressing.

The following varieties have hitherto been chiefly grown:—Havannah (which yields a good leaf for cigars), Connecticut, Kentucky, Virginia, and Florida. The yield of the first, which produces but small leaves, is not large, ten to twelve cwt. per acre being considered a good crop. From fifteen to eighteen and twenty cwt. may be obtained from the other larger-leaved varieties.

The total area occupied in 1865 with tobacco was 397 acres, from which 3228 cwt. of leaves were harvested.

Before concluding these short notes on agricultural products, a few words may not be out of place regarding such plants as have been cultivated occasionally and experimentally only, but a more general introduction of which would appear desirable.

First amongst these stands flax, which to all appearances is unquestionably fitted for our soil and climate. In the Geelong district especially it has shown itself so promising that the necessary machinery for dressing it has been constructed;* and we may expect to hear shortly of some favourable and more extensive results of this industry, both for yields of oil and fibre. Hemp has been successfully grown in the Upper Yarra district, and also near Melbourne, from whence some fine samples of grain and fibre have been exhibited in Melbourne. Hops, though nowhere extensively cultivated, have been found to do well on the alluvial soils in the Warrnambool districts, and in similar localities where they are sufficiently sheltered against hot winds, &c. The favourable returns of hop culture in Tasmania indicate that throughout the moister mountain regions of this colony its cultivation might probably be advantageously pursued.

* Vide *Australasian*.

Favourable reports have been obtained from Western Port and elsewhere regarding the cultivation of arrowroot. The plants under cultivation in the Botanic Gardens, and also at Western Port, have shown an extraordinary vigour. It must, however, be understood that this applies to the *canna edulis*.

Some fair samples of cotton obtained from near Sandhurst, and others from the Loddon Valley and the Goulburn River, have from time to time been brought forward at local exhibitions. It appears, however, as if, in the southern parts of Victoria at least, the autumnal warmth was not of sufficient duration to mature a plentiful crop, and, as a mercantile speculation, the cultivation of cotton in these parts of Victoria can scarcely be recommended. In East Gippsland it has as yet not been sufficiently tried. The Board of Agriculture has distributed the seed of mustard, with a view of promoting the cultivation of this productive and universally used commodity; it remains to be shown whether the plant can cope with the aphis.

Numerous other plants of utility have as yet been totally overlooked by our agriculturists, although the success attending their cultivation can scarcely be doubted. Many medicinal, dye, fibre, and oil plants, or such as may be otherwise utilised for industrial or other purposes, are well worthy a place in our fields. Madder, woad, dyersweld and safflor, New Zealand flax (which latter has become already an almost universally employed green tieing material, in orchards and vineyards), and many of the malvaceous plants—Madia sativa, Guizotia oleifera, Helianthus annuus, the well-known sunflower, Myagrum sativum, the castor oil plant (yielding both the much-used oil, aud food for silkworms), poppy (the latter useful either for the preparation of opium or as yielding an excellent oil), and many others, would come under this category.

Agriculture is so closely connected with rearing cattle and other live stock that it can scarcely be carried out without it, and a system of mixed farming has accordingly been generally adopted, combining the two objects, and utilising the products obtained from each in the best possible manner. The advantages to be derived from such a system are, however, even greater in Australia, where the extent of the separate holdings is generally much larger than in European countries. The rational farmer will be able to derive here nearly all the advantages from his live stock, without being obliged to spend so much labour and care upon them. In this mild climate stock may be turned out the whole year, and in general seasons find abundance of food. It may be mentioned that on some of the natural pastures bullocks have been fattened and found to weigh, when slaughtered for the butcher, between 1200 and 1400 lbs., but these are entirely exceptional cases. Natural pastures, improved by artificial means, will enable the farmer to double the quantity of stock upon them, and by this system provision can be made for any surplus he may not wish to dispose of. It is nevertheless certain that there is room for improvement in the system of feeding of dairy cattle and working stock. Wherever the former have been stabled and fed during the night, a large increase in the quantity of milk is obtained. The manure from animals thus kept enables the farmer to keep his land in good heart, and to obtain good results, which again make it possible for him to maintain a larger number of animals on the same piece of land than he could do had he relied only on the natural pasture. Dairy farms (exclusively) carried on on this principle,

which have been established near Melbourne, appear to be very remunerative. From one of these, described in the public journals,* comprising only 350 acres, 100 pounds of butter and 4000 quarts of milk were sold weekly, whilst an additional considerable profit was made by rearing and fattening pigs.

A ready sale of milk can always be found in towns, and it is near these, or along lines of railway, which offer such facilities for its conveyance, where dairies are profitable. But even at greater distances similar establishments would most likely prove remunerative, if the manufacture of cheese and butter were carried on extensively. We might safely follow herein the example set us in America, where cheese manufactories have been established, supplied by farms on which there are sometimes more than one thousand head of milking cows, all the produce being converted into cheese. With the almost unbounded extent of pasture in Victoria, and the great facilities for improving them, and other conveniences, as good results as are obtained in the United States might easily be secured here.

For a number of years the adaptability of our climate for the cultivation of the grape vine had been recognised, and also practically tested, by the success which crowned the establishment of several rather extensive vineyards in the Geelong district, where, as early as 1846, and somewhat later elsewhere, several had been formed. But though the fact had been established beyond any doubt, that vines would grow with the greatest luxuriance and produce an abundance of fruit, the wine manufactured was, with few exceptions, but little relished at first, a fact which is not surprising if it is considered that, owing to the want of proper cellars and consequent insufficient attention, most wines had to be brought into consumption soon after they were made, and before they had time to ripen. The difficulty of obtaining sufficient quantities of plants or cuttings of any particular sort suited to the locality frequently led to an indiscriminate mixing of all kinds, none of which were in sufficient quantities to allow of a separate pressing of each variety at the time of the vintage, even had that been practicable; thus, in early days, an inferior wine was made, solely from such unadvisable mixing, frequently of inferior sorts with those of far superior value.

All these circumstances, combined with the facility and rapidity with which in former years other pursuits were made remunerative, prevented for a time the more rapid development and extension of our vineyards, comprising in 1856 only 279 acres, from which nearly 11,000 gallons of wine and 340 gallons of brandy were obtained. Profiting by the experience of former years, and recognising more fully the great importance which the production of wine is sure to gain, a marked increase of the land planted with vines took place after that year, and in 1860 there were already 1138 acres, which five years later, in 1865, had increased nearly four-fold, viz., to 4078 acres, on which 8,199,618 vines had been planted, producing 176,959 gallons wine and 795 gallons brandy; as well as 18,063 cwt. of grapes sold as fruit. In almost all the districts of Victoria vineyards have now sprung up, and even at this early stage of their development the different characters of the wines from each of them can be distinguished.

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* Vide *Farmers' Journal*, July, 1863.

The chief vine-growing districts at present are:—

1.	In the	County of Grant	990	Acres.
2.	,,	Murray District	824	,,
3.	,,	County of Bourke	720	,,
4.	,,	Loddon District	499	,,
5.	,,	Evelyn District	359	,,
6.	,,	Talbot District	281	,,

The greatest extent of land planted with vines, and comprising the oldest established and some of the most extensive vineyards, are in the Geelong district. The rich sandy loams which cover the gentle slopes of the Barrabool Hills, and those of the Moorabool Valley, offer admirable sites for the cultivation of the vine; and the natural advantages have been gladly seized by numerous vignerons, many of whom are natives of the wine-producing districts of France, Switzerland, or Germany. Shiraz, Black Cluster, Burgundy, Black Espar, and La Gloire are the favourite and mostly cultivated sorts of black, and Chasselas, Gouais, and Tokay of white, grapes. The wines obtained from either of these sorts, provided they are treated properly, are generally speaking fair samples of their kinds. Their value as a refreshing, light, and healthy beverage, especially during the hot summer months, has been fully recognised; and with the facilities now offered for the retail trade in colonial wines, ready sales of all sound and good samples can always be effected.

Very excellent kinds of wine have been made when attention has been paid to the careful selection and picking the grapes, especially of Hermitage, which is strong and richly flavoured, full of bouquet and of fine colour.

Verdeilho and Riesling are two excellent sorts of grapes (if not the best) for the production of strong and really good wine; they are fair bearers, and well adapted for our climate, and have come more and more into favour. In most of the recent plantations they form a large proportion of the sorts selected. Vineyards of considerable size have been formed on the Upper Yarra, the produce of which has, on account of its excellence, already gained a good name in our market. There are others, mostly of smaller size, nearer Melbourne. Some very large and well-arranged establishments have been formed near Sunbury and Riddell's Creek, on the fine basaltic soils which prevail there.

Though most of these vineyards are too young as yet to produce much wine, there can be no doubt that the produce from this locality will be of first-class quality, not only on account of the soil being remarkably good and suitable for vines, but also because the climate is much milder than that nearer the sea coast, so that the grapes will ripen much better.

Some exquisite wine grapes are grown on the banks of the Upper Murray, and the wine from thence has proved admirable.

Proceeding farther north, we find considerable attention given to their culture, which is crowned with much success. There are some rather extensive vineyards in the neighbourhoods of Castlemaine and Sandhurst, from some of which, though only of recent origin, samples of very superior wines have been realised. The Murray Valley, from Albury downwards to Echuca, and the adjacent localities, promise also to rank very high as vine-growing districts. A very large extent of land has already been devoted to the formation of vineyards, from which very excellently flavoured and otherwise superior wines are already produced in considerable quantities.

Though several experiments have fully demonstrated the practicability and probable remunerativeness of the preparation of raisins and currants (for both of which suitable sorts of vines are to be found), all that has been done in this branch of industry is very little, and has nowhere, as yet, been earnestly taken up.

It has not been deemed necessary to append to this document detailed statements regarding the cultivation of other fruits, though some highly interesting and encouraging data might have been adduced. In the resource report, issued some years ago by the Royal Society of Victoria, ample data on the horticultural products of this country have been given already. The excellence, the prolific yield, and the sizes of fruits and vegetables proved in many localities extraordinary. Suffice it here to remark, that the annual augmentation of garden tillage has been considerable indeed; that in our industrial and horticultural exhibitions excellent samples of dried fruits, preserves, pickles, &c., were shown; and that these indigenous articles have become in some instances already objects of ordinary trade, and bid fair to supply hereafter our own requirements, if not finally serving even for exportation. Some years ago it was suggested by the Director of the Botanic Garden that the example set on the continent could be followed here advantageously—to line public roads, in fertile districts, with fruit trees and trees otherwise useful, a measure which, under thoughtful and systematic management, can be rendered not only grateful to passing travellers, but also a source of revenue to the State.

INTERCOLONIAL EXHIBITION ESSAYS, 1866-67.

No. 7.

ON THE RECENT

ZOOLOGY AND PALÆONTOLOGY OF VICTORIA.

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ON THE RECENT

ZOOLOGY AND PALÆONTOLOGY OF VICTORIA.

I SHALL only refer in the following pages to those species of animals affording economically useful materials, or of some special present interest in relation to unsettled scientific questions.

ZOOLOGY.

MAMMALIA.

Very few of the Victorian quadrupeds are economically useful. The skins of the various Kangaroo *(Macropus* and *Osphranter)*, Wallabi *(Halmaturus)*, and Wombats *(Phascolomys)* afford various qualities of leather, but are at present very little used; and for food the only portions of any native quadruped appearing in the market are the tails of the larger kangaroo, for soup. The flesh of the smaller kinds, as well as that of Wombats, Opossums *(Phalangista vulpina* and *P. Viverrina* var. *Victoriæ)*,* Hare-Kangaroo, and Kangaroo Rats *(Lagorchestes* and *Hypsiprimnus)* and Bandicoots, *(Perameles obesula* and *P. fasciata)* afford abundant food to the natives and wanderers lost in the bush.

The gigantic red Kangaroo *(Osphranter rufus)* is only found towards the warm northern boundary of the colony, where it occurs in immense numbers, along with the rather rarer sooty Kangaroo *(Macropus fuliginosus)*, and the *Macropus ocydromus* of Gould, which is certainly a good and distinct species. These three species are replaced in the cooler southern part of Victoria by the *Macropus major*—the great "Old Man," or "Boomer" Kangaroo, as the male is termed by the colonists. Since the new law increasing the fencing of the country taken up for pastoral purposes, the number of individuals of those species of Kangaroo has increased prodigiously, so that hundreds are on occasions killed on some of the squatters' runs merely to save the grass for the sheep. The extensive poisoning of the

* The common Ring-tail Opossum of Victoria has no specific relation to the rusty *P. Cooki* of New South Wales, and is constantly distinguishable from the *P. viverrina* of Tasmania, of which it is at least a variety which we may conveniently refer to under the name of *P. Victoriæ*.

Native Dog, or Dingoes, by strychnine also tends of late years to increase very greatly the numbers of the plant-eating animals. The Wallabies of the southern part of the colony are the *Halmaturus uallabatus*, chiefly of the islands in Bass's Straits, on some of which *H. Bennetti* also occurs; and curiously enough I find the *H. Brachyurus*, looked upon by Gould as a rare species of Western Australia, is the common species of the south-eastern portion of Victoria.

As some uncertainty seems to have been felt as to the occurrence of the genus *Molossus* in Victoria, it may be interesting to state that I have lately got some additional examples of the *M. Australis* (now in the Museum) from a hollow tree near Melbourne, so that there can be no doubt of the fact of the genus extending to Victoria, although the habitat is so abnormal.

Of Seals, two species are not uncommon—the Eared Seal *(Arctocephalus lobatus)* and the large spotted "Sea Leopard" *(Stenorhynchus leptonyx)*, but they are so much less abundant than formerly that sealing has been quite given up for many years. The fur of the Victorian Fur-Seal is of good quality when properly dressed. Fur-rugs of beautiful softness, close and warm, and often of elegant appearance, are annually made in thousands of the skins of the "Opossum" *(Phalangista vulpina)* and the "Native Cat" *(Dasyurus viverrinus)*, not only as carriage wraps, but for use instead of blankets by the great number of people whose business leads them to sleep in the open air. So abundant and easily obtained are these skins that a profitable export trade might possibly result from their becoming better known to the European furriers.

Of *Cetacea*, a great number of the smaller-toothed sorts, of no economic value, may be seen on our coasts, but also, occasionally, whalebone whales of enormous size are stranded on the shores, and the oil and whalebone sent to market, without giving rise to any extensive whaling expeditions into the southern waters. One of these whalebone whales, 90 feet in length, was cast on our shores last winter, and I have secured the skeleton of it for our Museum. It proves to be a new species of the genus *Physalus*, or "Finner." The pectoral is about one-eighth of the total length, and the ribs are sixteen on each side, and there are about sixty vertebræ. It cannot be referred to the New Zealand *Physalus antarcticus*, as the "baleen" is black. The largest blades of baleen are eighteen inches wide at base, and twenty-eight inches long. This species, of which I hope to publish a more detailed illustrated description shortly, I name *Physalus Grayi* (M'Coy), after my valued friend, Dr. Gray, of the British Museum, whose researches on the *Cetacea* have so greatly aided and stimulated the recent investigations in this difficult branch of Zoology. The whalebone of this whale, like that of the other "Finners," is only fit for splitting into the false bristles for brushes, &c.

BIRDS.

As my friend, Mr. Gould, has recently published in his *Handbook of the Birds of Australia* a list showing the geographical distribution of the species generally over the continent, I subjoin a list of those of Victoria, as the least perfectly known of the colonies, and presenting several interesting modifications of Mr. Gould's list.

I would remark that the specimen of *Dendrocygna Eytoni* in the Melbourne Museum was purchased in the poultry market, and seen by myself with the flesh untouched, so that there is no room for the doubt which has been expressed of the species occurring in Victoria. Another interesting species, the Indian and European Little Egret (*Herodias Garzetta*), which is only doubtfully quoted by Mr. Gould as an Australian bird, I have carefully identified from a Gippsland specimen now in our Museum. The very rare *Pycnoptilus floccosus*, the locality of which Mr. Gould is not certain of, occurs not uncommonly in the dense brushes of the Yarra mountains. The new species of Bristle-bird (*Sphenura Broadbenti*) (M'Coy) is a very rare addition to this curious genus, easily distinguished by its rufus head from the previously-known species. The *Pardalotus xanthopyge* (M'Coy) is a new species, brought under my notice by Mr. Leadbeater, and which seems to appear first in the north-west part of Victoria, and gradually to increase in numbers towards Adelaide, where it seems to replace the *P. punctatus*, with which it has previously been confounded.

List of the Birds of Victoria.

(Specimens of all of which are in the National Museum of Melbourne.)

Ord. I.—Raptores.

1. *Fam. Falconidæ*—
   Aquila audax
   Polioaëtus leucogaster
   Falco hypoleucus
   ,, melanogenys
   ,, subniger
   ,, lunulatus
   Hieracidea Berigora
   ,, occidentalis
   Tinnunculus cenchroides
   Leucospiza Raii
   ,, Novæ Hollandiæ (Albino)
   Astur approximans
   ,, cruentus
   Accipiter torquatus
   Milvus affinis
   Elanus axillaris
   ,, scriptus
   Circus assimilis
   ,, Jardinii

2. *Fam. Strigidæ*—
   Strix Novæ Hollandiæ
   ,, tenebricosus
   ,, delicatulus
   Hieracoglaux strenuus
   ,, connivens
   Spiloglaux Boobook

Ord. II.—Insessores.

1. *Fam. Caprimulgidæ*—
   Ægotheles Novæ Hollandiæ
   Podargus strigoides
   ,, brachypterus
   Eurostopodus albogularis

2. *Fam. Cypselidæ*—
   Chaetura caudacuta
   Cypselus pacificus

3. *Fam. Hirundinidæ*—
   Hirundo frontalis
   Hylochelidon nigricans
   Cheramoeca leucosterna

4. *Fam. Meropidæ*—
   Merops ornatus

6. *Fam. Alcedinidæ*—
   Dacelo gigas
   Todiramphus sanctus
   ,, pyrrhopygius
   Alcyone azurea

7. *Fam. Artamidæ*—
   Artamus sordidus
   ,, personatus
   ,, superciliosus
   ,, leucopygialis

8. *Fam. Ampelidæ*—
   Pardalotus striatus
   ,, punctatus
   ,, affinis
   • ,, xanthopyge (M'Coy)

9. *Fam. Laniadæ*—
   Strepera graculina
   ,, Anaphonensis
   Gymnorhina Tibicen
   ,, leuconota
   Cracticus torquatus

10. *Fam.* (?)—
   Grallina picata

11. *Fam. Campephagidæ*—
Graucalus melanops
,, mentalis
Pteropodocys phasianella
Campephaga Jardini
,, humeralis
Pachycephala glaucura
,, melanura
,, rufiventris
,, rufogularis
,, olivacea
Colluricincla harmonica
Falcunculus frontatus
Oreoica cristata

12. *Fam. Dicruridæ*—
Chibia bracteata

13. *Fam. Muscicapidiæ*—
Rhipidura albiscapa
,, rufifrons
Sauloprocta motacilloides
Seizura inquieta
Piezorhynchus nitidus
Myiagra plumbea
,, concinna
,, nitida
Microëca fascinans
Monarcha carinata
,, trivirgata

14. *Fam.* (?)—
Smicrornis brevirostris

15. *Fam. Saxicolidæ*—
Erythrodryas rhodinogaster
Petroica multicolor
,, Goodenovii
,, phœnicea
Melanodryas cucullata
Eopsaltria australis

16. *Fam. Menuridæ*—
Menura superba
Psophodes crepitans

17. *Fam.* (?)—
Malurus cyaneus
,, melanotos
Stipiturus malachurus
Sphenura Broadbenti (M'Coy)
Pycnoptilus floccosus
Cisticola exilis
,, lineocapilla
,, ruficeps
Sericornis osculans
Acanthiza Diemenensis
,, nana
,, lineata
Geobasileus chrysorrhous
Ephthianura albifrons
,, tricolor
,, aurifrons
Calamanthus fuliginosus
Chthonicola sagittata

18. *Fam. Motacillidæ*—
Authus australis
Cincloramphus cantillans
Ptenœdus rufescens

19. *Fam.* (?)—
Sphenœacus gramineus

20. *Fam. Sylviadæ*—
Calamoherpe australis
Mirafra Horsfieldii

21. *Fam. Fringillidæ*—
Zonæginthus bellus
Ægintha temporalis
Stagonopleura guttata

22. *Fam. Merulidæ*—
Cinclosoma punctatum
,, castaneonotum
Oreocincla lunulata

23. *Fam. Paradiseidæ*—
Ptilonorhynchus holosericeus
Chlamydodera maculata
Mimeta viridis

24. *Fam.* (?)—
Corcorax melanoramphus

26. *Fam. Corvidæ*—
Corvus australis

28. *Fam. Crateropodidæ*—
Pomatostomos temporalis
,, superciliosus
,, ruficeps

29. *Fam. Meliphagidæ*—
Meliornis longirostris
Lichmera australasiana
Glyciphila fulvifrons
,, albifrons
Ptilotis Lewinii
,, leucotis
,, auricomis
,, ornata
,, penicillata
,, fusca
,, chrysops
Plectorhyncha lanceolata
Meliphaga phrygia
Entomophila picta
Anthochæra carunculata
Anellobia mellivora
,, lunulata
Tropidorhynchus corniculatus
,, citreogularis
Acanthorhynchus tenuirostris
Myzomela sanguinolenta
,, nigra
Entomyza cyanotis
Melithreptus gularis
,, lunulatus
Myzantha garrula
Manorhina melanophrys
Dicaeum hirundinaceum

30. *Fam.* (?)—
Zosterops coerulescens

32. *Fam. Certhiadæ*—
Climacteris scandens
,, erythrops
,, leucoptera
Sitella chrysoptera

33. *Fam. Cuculidæ*—
Cacomantis pallidus
,, flabelliformis
,, insperatus
Lamprococcyx plagosus

34. *Fam. Psittacidæ*—
Cacatua galerita
,, Leadbeateri
,, Roseicapilla
Licmetis tenuirostris
Calyptorhynchus Leachii
,, funereus
,, naso
Callocephalon galeatum
Polytelis Barrabandi
,, melanura
Aprosmictus scapulatus
Platycercus Penantii
,, Adelaidensis
,, zonarius
,, flaveolus
,, eximius
Psephotus hæmatorrhous
,, hæmatonotus
Euphema chrysostoma
,, elegans
,, aurantia
,, pulchella
,, Bourkii
Melopsittacus undulatus
Calopsitta Novæ Hollandiæ
Pezoporus formosus
Lathamus discolor
Trychoglossus multicolor
,, chlorolepidotus
Glossopsitta australis
,, porphyrocephalus
,, pusilla

ORD. III.—RASORES.

1. *Fam. Columbidæ*—
Phaps chalioptera
,, elegans
Oryphaps lophotes
Geopelia tranquilla
Stictopelia cuneata

2. *Fam. Megapodidæ*—
Leipoa ocellata

3. *Fam. Turnicidæ*—
Turnix varius
,, scintillans
,, velox
,, pyrrhothorax
Pedionomus torquatus

4. *Fam. Perdicidæ*—
Coturnix pectoralis
Synoicus australis
,, diemenensis
,, sordidus
Excalfatoria australis

ORD. IV.—GRALLATORES.

1. *Fam. Struthionidæ*—
Dromaius Novæ Hollandiæ

2. *Fam. Otitidæ*—
Chloriotis australis

3. *Fam. Charadriadæ*—
Œdicnemus grallarius
Hæmatopus longirostris
,, fuliginosus
Lobivanellus lobatus
Sarciophorus pectoralis
Charadrius orientalis
Eudromias australis
Cirrepidesmus asiaticus
Ægialites monacha
,, nigrifrons
Erythrogonys cinctus
Ochthodromus inornatus
,, bicinctus

5. *Fam. Himantopidæ*—
Himantopus leucocephalus
Cladorhynchus pectoralis

6. *Fam. Recurvirostridæ*—
Recurvirostra rubricollis

7. *Fam. Limosidæ*—
Limosa melanuroides
,, uropygialis

8. *Fam. Tringidæ*—
Limnocinclus acuminatus
Ancylochilus subarquatus
Actodromas australis
Glottis glottoides

9. *Fam. Scolopacidæ*—
Gallinago australis
Rhynchæa australis

10. *Fam.* (?)—
Numenius cyanopus

11. *Fam. Tantalidæ*—
Carphibis spinicollis
Threskiornis strictipennis
Falcinellus igneus
Platalea regia
Platibis flavipes

12. *Fam. Gruidæ*—
Grus australasianus

14. *Fam. Ardeidæ*—
Ardea pacifica
Herodias alba
,, egrettoides
,, garzetta
Demgiegretta Greyi
Nycticorax Caledonicus
Botaurus poiciloptilus
Butoroides flavicollis
Ardetta pusilla

15. *Fam. Rallidæ*—
Porphyrio melanotus
Tribonyx ventralis
Gallinula tenebrosa
Fulica australis

Hypotænidia Philippensis
Rallus brachipus
Porzana fluminea
,, palustris
,, tabuensis

ORD. V.—NATATORES.

1. *Fam. Anatidæ*—
Chenopis atrata
Cereopsis Novæ Hollandiæ
Anseranas melanoleuca
Chlamydochen jubata
Casarca Tadornoides
Anas superciliosa
,, punctata
Stictonetta nævosa
Spatula rhynchotis
Malacorhynchus membranaceus
Dendrocygna Eytoni
Nyroca australis
Erismatura australis
Biziura lobata

2. *Fam. Laridæ*—
Larus pacificus
Bruchigavia Jamesonii

3. *Fam. Sternidæ*—
Sylochelidon caspia
Thalasseus poliocercus
Sternula nereis
Hydrochelidon leucopareia

4. *Fam. Procellaridæ*—
Diomedea exulans
,, cauta
,, culminata
Phœbetria fuliginosa
Ossifraga gigantea
Nectris brevicaudus
Daption capensis
Prion turtur
Pelagodroma fregata
Haladroma urinatrix

5. *Fam. Pelecanidæ*—
Pelecanus conspicillatus
Phalacrocorax Novæ Hollandiæ
,, leucogaster
,, melanoleucus
,, stictocephalus
Plotus Novæ Hollandiæ
Tachypetes aquila
Sula australis

6. *Fam. Podicipidæ*—
Podiceps australis
,, nestor
,, gularis

7. *Fam. Spheniscidæ*—
Eudyptula undina
Chrysocoma catarractes

REPTILIA.

Of this division of the animal kingdom there are scarcely any Victorian forms of economic importance. The edible "green" Turtle, *Chelonia viridis*, is a very rare visitor to our shores, two examples being all that I have any knowledge of, both now in the Museum. An example of the Leathery Turtle, *Sphargis coriacea*, caught at Portland, on our west coast, gives the most southern range of the species known. Our two fresh-water *Chelonians*, *Chelodina oblonga* and *C. longicollis*, are only found in the rivers towards the northern boundary of Victoria, where they are common. Of these a kind of turtle soup was made at the dinner of the Melbourne Acclimatisation Society, but the taste for it has not yet been acquired.

The *Crocodilia* do not come down the Australian coast so far south as Victoria, the largest of the *Sauria* being the *Hydrosaurus varius*, called "Iguana" by the colonists, of five or six feet. Of the skin of this species some slippers and other small articles in the Intercolonial Exhibition now open in Melbourne are manufactured with much elegance. The natives use it for food. The *Trachydosaurus rugosus*, *Cyclodus gigas*, *Hinnulia tæniolata*, and *Grammatophora barbata*, abound in the warmer north part of the colony, but gradually disappear towards the south coast.

Of snakes the following species occur, and the larger and more common are roasted and eaten by the natives:—*Morelia variegata*, or Carpet Snake, the only Python and non-venomous snake in Victoria, and confined to the northern boundary; *Acanthophis antarctica*, or "Death Adder," also confined to the northern boundary; *Hoplocephalus curtus*, or "Tiger Snake," very

common about Melbourne, and the cause of most of the accidents from snake bites; *H. flagellum*, or "Little Whip Snake," *H. coronoides*, and *Hoplocephalus superbus*. This latter species, with fifteen rows of scales, the two outer rows with red centres, is very common about Prahran, near Melbourne, though said to occur only in Tasmania; the neck is not dilatable into a flat hood, as in the *H. curtus*. The "Black Snake," *Pseudechys porphyraicus*, is rather rare, and the *P. Australis* is only found with us near our northern boundary. The common "Brown Snake" may possibly include two species, but I doubt the distinctions between *Pseudonaja nuchalis* and *Diemenia superciliaris* being permanent; at any rate, specimens with the proportions of the rostral shield of the latter are common, and several intermediate proportions varying to that characteristic of the former occur. *Diemenia reticulata* is very common on the Lower Murray boundary.

The *Batrachia*, with the exception of the common green frog, *Ranhyla aurea*, are rarely seen or heard; the true tree frogs (*Hyla*) inhabiting the lofty gum trees, and the *Lymnodynastes Tasmanicus*, *L. dorsalis* and *L. affinis*, burrowing in the sand during the day.

PISCES.

The species of fish good for the table are very much fewer in Victoria than in Europe, and great interest attaches, therefore, with many of the general public, to the endeavours of the Acclimatisation Society of Victoria to introduce the Salmon and other good British fish into the waters of the colony, independent of the scientific interest of the experiment. Large English Trout are now in considerable numbers from ova imported, packed in ice, by our Victorian Acclimatisation Society, acting in conjunction with the Tasmanian Government. Not only were numbers of Parr hatched in the Victorian and Tasmanian rivers from the Salmon ova imported in this way, but there is now in the Exhibition one caught a few weeks ago in the Tamar River, about ten inches in length, which has lost the marks of the parr, and assumed the bright silvery aspect of the migratory stage of development, or "grilse." This is a great success for acclimatisation and pisciculture, and shows that none of the insuperable difficulties which were supposed in England to bar our success with the *Salmonidæ* really exist; but that food and climate, and quality of water of such of our rivers as flow all the year, are sufficiently suitable to permit of success.

The cartilaginous fishes are supposed to be so abundant here as greatly to diminish the chance of the acclimatised Salmon returning in safety from the sea; but I do not think they are as numerous as in Britain.

The *Callorhynchus antarctica*, or Southern Chimera, is common near Portland at short distances from the shore; and all round our coast the Port Jackson Shark, or "Bulldog Shark," as it is called by the colonists (*Cestracion* (*Heterodontus*) *Phillipi*), is not uncommon. The most beautiful and curious of our Sharks is that called "Carpet Shark" by the colonists—the *Crossorhinus barbatus*. The largest of our Sharks, the "Black-finned Shark" (*Carcharinus melanopterus*), is so rare that I have seen only one specimen (fifteen feet long) from Hobson's Bay. The European "Hammer-headed Shark" (*Sphyrnias zygæna*) is not very uncommon. But what is very curious, we find the

common English "Tope" *(Galeus canus)* common in the Bay; and more extraordinary still, the common English "Smooth Hound" *(Mustelus vulgaris)* is the commonest Dog-fish, or Small Shark, of our coast, occurring in great numbers in Hobson's Bay, undistinguishable from Cornish specimens. The large *Odontaspis taurus* is, perhaps, our commonest, large and very destructive, species, although the Indian *Heptranchus indicus* is not uncommon also. Another large Shark, perfectly identical with the English species, is the "Angel Fish" *(Squatina vulgaris)*, not very uncommon. Intermediate between the Sharks and Rays we have the tentaculated "Saw Fish" *(Pristiophorus cirratus)* in abundance, and the rare *Trigonorhina fasciata*. These, with one or two Rays *(Raja Lemprieri*, &c.), two large "Sting Rays" *(Trygon)*, and a rare *Cephaloptera*, are the chief predacious *Chondropterygii*. One small Lamprey is not uncommon in the Murray, and another, *Mordacia*, in the Saltwater River.

Of bony fish there are numerous genera and species; of these I need only now advert to a few used for food, or otherwise interesting. Of the *Percidæ*, one of the very best table fish is the *Lates colonorum*, or "Gippsland Perch," which has appeared of late years in the market. Also of this family is our most gigantic river fish, the "Murray Cod-perch" *(Oligorus Macquariensis)*, which is often three feet long and upwards of 20 lbs. weight; it is, perhaps, the most commonly seen at table of all the Victorian fish, although not at all the best; it is now brought to the Melbourne markets in great numbers by the railway. The next example is the most abundant and cheapest of the marine fish, never seen at the best tables, but used very extensively as food by the poorer people. It has the reputation of very frequently causing, even when perfectly fresh, the most violent symptoms of fish-poisoning, accompanied by a peculiar redness of the face and great suffering, sometimes ending in death; although so irregular in its action that other persons eating of the same fish have experienced no ill effects. It is the *Arripis Georgianus*, and is called by the fishermen "Salmon," when old and of a uniform olive tint, and "Salmon Trout" in the younger spotted stage of growth. I have no doubt the *Centropristis Georgianus* (C. and V.), *C. salar* (Rich), *C. truttaceus* (C. and V.), and *Perca marginata* (C. and V.), are all synonymous of this one common species. An excellent river fish of this family is the *Dules ambiguus* of the Murray; it is popularly known as the "Murray Golden Perch," or sometimes "Murray Golden Carp," and far exceeds any of the other freshwater fish for the table in general estimation. Of the *Pristipomatidæ* the Murray River affords an excellent table fish, the *Theropon ellipticus*, known in the market and to the colonists generally as the "Murray Silver Perch," and it is now brought to Melbourne in great numbers by railway.

Amongst the mullets *(Mullidæ)* we have a representative of the European Red Mullet, forming an equally delicious delicacy when cooked in the same way; it is the "Australian Red Mullet," the *Upeneichthys porosus*, which, like its home representative, is only occasionally found, and must be considered as a rarity. The family *Sparidæ* affords the most important fish for the table found in the Victorian seas, when we take its size (occasionally reaching 20 lbs. weight), abundance, and excellence together into account—it is the *Pagrus unicolor*, or "Snapper," of the colonists; and to this family also belongs one of the most popular fishes with the anglers in the mouths of the rivers near Melbourne, as giving good sport and forming an agreeable addition to the dinner table: it is the "Bream" of the colonists,

the *Chrysophrys Australis*. The *Chironemus marmoratus* is not uncommon in the market—I have heard the name "Carpet Fish" applied to it; but I may here remark that the community is so new that the vulgar or popular names are not to be relied upon as in older countries, and vary irregularly within short distances. A nearly-allied fish, universally known as the "Butter Fish," and often found at table although not very good, is the *Chilodactylus nigricans*; the uniform colour supposed by authors to characterise this species is only found in the nearly adult examples, I find, and the young are marbled with brown and bluish-grey. The *Chilodactylus macropterus*, although common in the market, seems to have no common name. The finest of all the Australian marine fishes for the table is the "Trumpeter" of the colonists, formerly supposed to be confined to Tasmania, but now found so abundantly on some fishing banks in the track of the steamers plying to Melbourne that at certain seasons it is abundant in the Victorian markets; it is the *Latris hecateia*. Several species of *Platycephalus*, of which *P. Tasmanius* and *P. lævigatus* are the most common, are confounded under the common popular name of "Flat-head," given to the commonest edible fish of the Victorian coasts, found abundantly, and easily caught by line all the year round; these are eaten by people living on the coasts, and are always in the market, but not good enough to be held in any esteem for the table. Of "Gurnets," the beautiful *Lepidotrigla vanessa*, and the *Trigla Kumu* and *Trigla polyommata*, are not uncommon occasional visitors, but more noted for their extraordinary beauty than as food, for which I have not known them used. In the family *Trachinidæ*, several species of *Uranoscopidæ*, vulgarly called "Stone-lifters," of which the *Kathetostoma læve* is the commonest, occur on our shores, but are not used for food. Of the same family, however, there is one fish called "Whiting" by the colonists, although not at all like the European fish of that name, very abundant, always in the market, and so good as to be found at the best tables usually; it is the *Sillago punctata*. Of the family *Sciænidæ*, one example is a not uncommon occasional visitor, an exceedingly fine fish of excellent quality for the table, and often four feet in length; it is called "King-fish" by the Melbourne fishermen and dealers; I believe it to be perfectly identical with the "Maigre" of the Mediterranean and Cape of Good Hope, the *Sciæna aquila*. Of the family *Sphyrænidæ*, a tolerably good table fish is very common at times in the markets: it is the "Pike" of colonists, *Sphyræna Novæ Hollandiæ*. Of the allied family, *Trichiuridæ*, an equally abundant and even larger fish is found in great numbers in the market at certain seasons, the "Barracouta," perfectly identical with the *Thersites atun* of the Cape; it is one of the few fish dried and preserved in large quantities in Victoria. Of the *Scomberidæ*, the only true Mackerel are rare visitors, the *Scomber Australasicus* having only occurred to me twice in several years, and the *S. pneumatophoris* very lately; but of the "Tunny" we have a new species, *Thynnus Australis* (M'Coy), a not uncommon visitor; and the *Echeneis remora* is occasionally found in Hobson's Bay. The true "Dory," *Zeus faber*, perfectly identical with Mediterranean specimens, is a not very uncommon straggler into our seas; but in fish markets the infinitely inferior table fish, the Australian "Boar-fish," *Histiopterus recurvirostris*, is constantly sold under this name, although easily distinguished from the Dory, even by unscientific purchasers, by the want of the round dark spot in the middle of the sides. The *Cyttus (Capros) Australis* is common,

but too small to be used for the table. Of the allied family, *Carangidæ*, many interesting species occur in our seas. The common "Horse-mackerel," *Trachurus trachurus*, perfectly identical with English specimens, appears occasionally, and the *Caranx Georgianus*, under the name of "Silver-fish," is still more common. A fine species of *Seriola*, nearly three feet long, is occasionally caught in numbers, and is sometimes called by the fishmongers "Yellow-tail," as at St. Helena, and sometimes it is sold and noticed in the newspapers under the name of "Bonito," with which its size and quality of flesh caused them to confound it; it differs only in small details from the *Seriola Lalandi*, of which I believe it to be a mere trifling variety. A curious instance of an almost cosmopolitan fish of this same family, *Carangidæ*, is the "Skipjack," *Temnodon Saltator*, of which I have obtained many specimens in Hobson's Bay exactly identical with examples from New York, or the West Indies, or the Cape of Good Hope. There are many small species of *Gobius*, *Callionymus*, and *Blennius*, many of the latter viviparous, but they are not specially interesting or important. The *Clinus despicillatus* and *Cristiceps* abound amongst the sea-weed between high and low water marks. The Gouramier, *Asphronemus olfax*, has been introduced, and lived in a pond in my botanic garden at the University for nearly two years, until devoured by the herons; and they also lived in the ponds of the Acclimatisation Society long enough to show that the experiment of the acclimatisation of this famous table fish may be expected to succeed in ponds or tanks favourably placed. Two species of *Atherina* and two of *Mugil* are not uncommon in the Bay, but the commonest "Mullet" found abundantly in the fish-market for the table is the *Agonostoma Forsteri*. Two species of *Glyphidodon*, or *Melambaphes*, are common, and may often be found in the market, although not very good for the table; these are the *M. (Glyphidodon) nigroris*, called the "Black Perch," and the *Glyphidodon Victoriæ*, commonly called the "Rock Perch." The *Parma squamipennis* has occurred also to me not very uncommonly in the Bay. Several brilliantly-coloured fish of the family *Labridæ* occur as rare occasional visitors, but they are not worthy of special notice, the commonest and best known being that called "Parrot-fish;" it is the *Labrichthys ephippium*. The *Labrichthys laticlavius* and *L. psittacula*, and several others, also occur occasionally. A much-esteemed fish in the Yarra and other Victorian rivers is called "Black-fish" by the colonists; it is abundant, and sometimes exceeds a foot in length; it belongs to the genus *Gadopsis*, so remarkable for combining a spiny first dorsal fin with all the other characteristics of the *Anacanthini*; it is a mere variety, apparently, of the fish called "Freshwater Trout" in the Tasmanian rivers, the *Gadopsis marmoratus*. The *Lotella callarias* is a rare visitor, confounded with the *Pseudophysis barbatus* and two other species of *Pseudophysis*, under the common name of "Cod" and "Rock Cod" by the fish dealers. The "Flounder" of the colonists is a good table fish, with which the market is now regularly supplied; it seems peculiar to these seas, and is the *Rhombosolea flesoides*. A true sole *(Solea)*, nearly allied to the *Solea margaritifera*, also occurs, although rarely, at the Heads. Amongst the *Siluroid* fishes the most important is the *Copidoglanis tandanus*, which is now regularly supplied to the Melbourne market by railway from the River Murray, under the name of "Murray Catfish." The Yarra Yarra and some other of the rivers near the southern coast contain in great abundance a beautiful and active fish, excellent for the table, and

affording capital sport to the angler. By ichthyologists following the classification of Cuvier, it would be referred to the *Salmonidæ*, the adipose second dorsal fin being well marked; and so much does it resemble a Grayling, in the cucumber smell when caught, in general appearance, habits, mode of rising to the fly, and playing, as well as in flavour, that anglers are in the habit of calling it now the "Australian Grayling;" its close resemblance in food and habits to the true *Salmonidæ* helped the Acclimatisation Society to argue that certain of our rivers would serve for the experiment of acclimatising the European Salmon and Trout, and as experience has since shown, successfully; it is vulgarly also called the "Yarra Herring," and is the *Prototroctes maræna*. There is only one other fish known in Victoria with the second adipose dorsal fin and other characteristics of the Cuvierian *Salmonidæ* (but now referred to the *Scopelidæ*); it is the large and beautifully-coloured marine form, the *Aulopus purpurisatus*, of which I have got four specimens from Hobson's Bay for the Museum; it is too rare, however, to have a popular name, or be eaten.

Of the family *Clupeidæ*, or Herrings, there is only one of much importance in our seas. A specimen of this was first brought to me in August, 1864, from a small shoal, then seen for the first time in Hobson's Bay, and quite unknown to the fishermen. It was supposed by the sender to be the "Yarra Herring," or "Grayling," gone out to sea; but on examination I found it was the *Clupea melanosticta* of Temmink, or the species of Pilchard so abundant on the shores of Japan. In the same month in the succeeding year they appeared in greater abundance in the Bay, and were caught by thousands for the market. After remaining for a few weeks they disappeared until the same time in 1866, when they arrived in such countless thousands that carts were filled with them by simply dipping them out of the sea with large baskets; hundreds of tons of them were sent up the country to the inland market, and through the city for several weeks they were sold for a few pence the bucketful, while the captains of ships entering the Bay reported having passed through closely packed shoals of them for miles. They may probably be now expected every year as a very important addition to the food fishes of the country. I imagine some alteration of the bed of the sea, from the earthquake disturbances north of Australia about that time, may have facilitated or induced the extension of the shoals in such unusual quantities from Japan to our coasts. Dupery (or Lesson and Garnot) found it in New Zealand, and Cuvier and Valenciennes referred their specimen to the genus *Alausa*. I find, however, that the authors of the *Histoire des Poissons* were in error, and Temmink in the right, in the former assigning five, and the latter seven, gill rays; and it has also a row of teeth on the tongue, as was correctly stated by Temmink and erroneously denied by Cuvier and Valenciennes. The fish is therefore a *Meletta*, and not an *Alausa*, and should be referred to as the *Meletta melanosticta* (Tem. sp.). A true Anchovy I find in great abundance in Hobson's Bay; it is the *Engraulis Australis* (Wh. sp.), and if identical, as Cuvier supposes, with all the synonyms he groups under his *E. Browni*, would be almost a cosmopolitan species. The *Chatoesus come* is occasionally to be found in the market. Of the family *Galaxidæ* are several interesting species in our rivers, going under the vulgar names of "Gudgeon" and "Trout." The species of

Galaxias, bearing the latter name in the Yarra and the Gippsland rivers, is a beautiful new species, *Galaxias ocellatus* (M'Coy), marked with large circular eye-like spots, representing closely the *G. Truttaceus* of Tasmania. The species called popularly "Gudgeon," in the Yarra, is the *Galaxias pseudoscriba* (M'Coy), related to the *G. Scriba* (Cuv. and Val.), but with the depth of the body one-eighth of the total length, and other differences of proportion. The family *Murænidæ*, or Eels, is represented in the Bay by a large Conger; and the *Anguilla Australis* is the extremely abundant Eel of the Yarra, Saltwater River, and many other streams and the adjacent swamps filled by them. Of the family *Balistidæ* there are a great number of species, all going under the popular name of "Leather-Jackets," having the reputation of being poisonous, and of no economic value. Of the family *Tetraodontidæ*, the *Tetraodon Hamiltoni* is extremely abundant along the shores, popularly called "Toad-fish."

MOLLUSCA.

There are scarcely any molluscous animals of economic importance in the colony, the two species of Oysters used for food being imported from Sydney of late years. The *Venus strigosa* is sold in the fish shops under the erroneous name of "Cockle," and the *Lunella undulata* is eaten by persons near the coast under the equally erroneous name of "Winkles."

ARTICULA.

Of the articulated animals there are only a few *Crustacea* applied to any use. The great Murray River Crayfish, or Lobster *(Astacoides serratus)*, is brought in great numbers with the Murray fish by railway now to market, and is generally used at table as the lobster is in Europe. The smaller river Crayfish *(Astacoides quinquecarinatus)* is not sold in the markets, but is commonly eaten in the vicinity of the many streams and reservoirs in which it is found in abundance. The great marine spiny Crayfish or Lobster, found abundantly at the Heads, is constantly found in the shops, and used at table in salads, &c.; it seems to be a variety of the *Homarus annulicornis*, or a very closely allied species. A most destructive enemy to the submarine timbers of our piers belongs to this division of the animal kingdom; it is the little *Mylostoma* or *Chelura*, multiplying in the timbers, and causing them to crumble to pieces as in Europe. Of the *Insecta* no species are used for any useful purpose at present, although several species of the Coccus affording dyes abound. Of the *Annulata*, almost the only useful form is the species of Leech *Hirudo*, found so abundantly in the Murray River, which has the mouth so nearly like that of the *H. officinalis* of Europe that it is collected and used in immense quantities for medicinal purposes.

RADIATA AND PROTOZOA.

Of these divisions there are no economically useful kinds known, a few Sponges alone having been applied to any useful purpose.

PALÆONTOLOGY.

The Palæontology of Victoria and the adjacent parts of Australia is of very great interest, from the many unsettled scientific questions on which it bears.

POST-PLIOCENE AND PLIOCENE PERIODS.

The most recent geological period in Victoria, as in Europe, may be illustrated by the remains of bones found in caverns, and in the superficial drifts and clays deposited, apparently, at the same time as that at which the caverns became closed. These pleistocene and newer pliocene periods are in Victoria, as in Europe, remarkably rich in osseous remains of warm-blooded animals, some of which are still inhabitants of the spot; others still live, but in other countries; and many are extinct—generally of the same type of structure as the more characteristic living animals of the country, but of species frequently immensely superior in size to any that now live, repeating, in fact, in Australia that appearance of gigantic antitypes of the peculiar geographical groups of zoological structure marking the living zoology of the great regions of the earth at the present day. I believe the majority of the so-called alluvial gold deposits to be of this newer pliocene period. In the sinkings into the various drifts at the Ballarat goldfields, remains of timber and the characteristic fruits of the *Banksia*, or "Honey-suckle" trees of the colonists, are common, and, apparently, of the species still growing in the vicinity. In the clay beds, leaves are occasionally found in abundance, and perfectly preserved, undistinguishable from the foliage of the common "Stringy-bark" tree *(Eucalyptus obliqua)* of the neighbouring forests. In these gold drifts no marine remains have yet been found, and, indeed, few fossils of any kind; but in some of them—as, for instance, in the gold "cement" of Dunolly, I have found the jaw of a Wombat, of the same generic type (*Phascolomys*) so characteristic of the southern part of Australia and the adjacent island of Tasmania, but forming a distinct species *(Phascolomys pliocenus*, M'Coy), easily distinguished from the three living species of the same size by the greater antero-posterior length of the grinders. In the living and fossil lower jaws, having the same length from the tip of the incisor to the back of the hindermost grinder, the whole grinding, series, of one premolar and four molars, only measures as much as the four molars of the fossil species, the premolar of which thus stands entirely in front of the corresponding tooth in the three living ones of the same size. This Wombat enables me thus to connect the gold drifts in age with the more superficial red clays, in which the bones of Lake Timboon, &c., are found. And here we find with the living Dingo, or Native Wild Dog, inhabiting the neighbouring localities at present, skulls and teeth of the *Sarcophilus Ursinus*, or "Tasmanian Devil," which now is only known to exist in Tasmania, and has never been known on the mainland; with these are the bones and teeth of the gigantic extinct Kangaroos (the *Macropus Titan* and the *M. Atlas)*, as well as bones and teeth of the gigantic extinct genera *Nototherium* and *Diprotodon*. The species of

the latter occurring in Victoria is quite distinct from those of the more northern parts of the continent; it is the *Diprotodon longiceps* (M'Coy), readily distinguished by the more slender, elongate proportion of the jaws. The ordinary gold drifts of Victoria, from the association (more or less direct) with these fossils, may thus be taken to be of the newer pliocene, or mammaliferous crag period, like those of Russia, determined by Sir. R. Murchison.

MIOCENE PERIOD.

Under the pleistocene and pliocene deposits above alluded to are a series of plant beds in a few localities, with a totally different facies to the recent flora of the country, not one species being identical, nor are the characteristic genera represented, but an entirely extinct series of species having generic and general resemblance to the folinge of Asiatic plants of tropical types of dicotyledonus plants, of which the *Laurus* is the most conspicuous. Many of the forms are closely allied to those of the miocene plant beds of the Rhine country. In apparently the same position, in much more numerous localities, the marine deposits of sands and clays full of shells, echinoderms, corals, and with occasional fish, and with still rarer marine mammalian remains, occupy wide areas just under the pliocene beds. These have the general facies, and even specific identity of so many species, so clearly marked that there cannot be the slightest doubt of the great thickness of those beds being lower miocene of the date and general character of the Faluns of Touraine, the Bordeaux and the Malta beds; while the base of the series blends imperceptibly with a series of beds having a slightly older facies, and rendering the adoption of the Oligocene formation of Beyrich as convenient for Victorian as for European geologists. The only marine mammal of which I have seen portions which could be identified in those beds is a new species of *Squalodon*, or *Phocodon (P. Wilkinsoni*, M'Coy), from the miocene tertiary sands of the Cape Otway coast; and as the genus is only known in miocene strata of Malta and the French falun, the occurrence of a new species of so restricted a genus is not only valuable as an addition to palæontology, but an interesting fact, as showing that the zoology of Australia, as I have on former occasions endeavoured (contrary to received opinions) to establish, was not during the older tertiary period of the isolated exceptional character it now has, but was then closely related generically and even specifically, as I shall show, to many parts of Europe and America. The molar teeth of *P. Wilkinsoni* are smaller than the Malta *P. Scillæ*, and agree most nearly with the *Squalodon (Phocodon) Grateloupi* (Meyr) of the miocene beds near Bordeaux, from which the Australian species differs chiefly in smaller size, some details of proportions, and the relatively larger roots, indicating a greater depth of jaw. In these same beds remains of fish are not uncommon, and these are almost all of well-known European and American miocene and upper eocene tertiary extinct species of Plagiostomi. The most abundant widely distributed species is, I have no doubt, perfectly identical with the *Carcharodon angustidens* (Ag.) of the Bünde and other well-marked European lower miocene and oligocene beds. The *Carcharodon megalodon* (Ag.) is an almost equally common Australian miocene species, and on comparison, as in the former case, of specimens, undoubtedly identical with the

lower miocene and oligocene tertiary specimens from Malta, Bünde, and other European sections, and with those from the eocene London clay and North American localities. The *Otodus Desori* (Ag.), *Lamna elegans* (Ag.), and *L. contortidens* (Ag.) of the European and United States miocene localities are also common in many of our Victorian miocene beds, in which I have also identified the *Lamna denticulata* (Ag.), and the large teeth of *Oxyrhina trigonodon* (Ag.), exactly agreeing with those of the lower miocene beds of the Rhine country. Along with these entirely extinct plants, mammals, and fish there are many genera and species of Mollusca entirely extinct, many identical with extinct species of the same geological age in other localities both in Europe and North America, and many of the commonest forms are identical with living species, none of which are found in the adjacent seas of Victoria, but in warmer seas of north of New Zealand, Philippines, and South Africa, with one or two rare exceptions of species extending into colder latitudes in the northern hemisphere.

A fine new *Aturia (A. Australis,* M'Coy) is the most common and important of the fossil *Cephalopoda,* closely related to the *Aturia ziczac* of the lower miocene and upper eocene beds of Germany, France, and England; no species of *Aturia* lives now, the angulated septa contrasting strongly with the waved ones of recent *Nautilus.*

The *Gasteropoda* are very abundant and for the most part peculiar, several of them being closely representative types of well-known miocene and eocene European species, while others are identical with European and North American miocene and upper eocene species. Of these, one of the most striking is a *Dentalium* found in extraordinary abundance in nearly every locality of our Victorian miocene tertiaries, and yet no species of the genus has ever been found living in the Victorian seas. The fossil species is manifestly identical with the Belgian miocene tertiary *D. Kixii,* and the Victorian examples also agree completely on the most minute comparison with specimens I have from the lower miocene and oligocene beds of Flonheim, as well as with North American specimens I have from the upper eocene beds of Vicksburg, described by Conrad under the name *D. Mississippiense,* without observing its identity with the European miocene species. This *Dentalium,* occurring with the above-named extinct species of fish so abundantly together in Australia, as in the United States, France, and Germany, is a very curious additional instance of the general identity in facies of the marine zoology of Australia with that of Europe and Northern America during the miocene period, when all of these localities seem to have had a warmer climate than at present. Amongst the representative types the most extraordinary case is that of an entire series of *Volutes* in the oligocene clay-beds near Mount Martha and Mount Eliza on one side of Hobson's Bay, and the sandy beds of slightly younger age on the other side of the Bay south of Geelong, representing in the most complete manner the series of common species of *Volutilites* of the upper eocene or oligocene beds of the Isle of Wight, the Hampshire coast, and the corresponding French, Austrian, and Belgian strata of the basins of Paris, Vienna, and Limbourgh. In fact, the *V. suturalis* and *V. cingulata* (varieties of our species) of the "Tongrien" or lower miocene beds of Lattorf, near Bernberg, is so exactly represented by a species which I have called *Voluta anti-cingulata* (M'Coy), that on comparison of specimens with the tip of the spire absent

it would be almost impossible to separate them as the most trifling varieties, yet the European *V. cingulata* has the acute regular apex of the spire characteristic of the eocene genus *Volutilites*, while our Australian representative form has the obtuse mammillated tip of the more recent true genus *Voluta*. In the same lower miocene or oligocene on both sides of Hobson's Bay, we have great numbers of another species, the *Voluta anti-scalaris* (M'Coy), which so completely resembles the *Volutilites scalaris* equally common in the Isle of Wight and Hampshire cliff beds that on comparing specimens from the two localities the nicest eye could scarcely find character for a variety except the same generic difference of the acute regular tip to the spire in the European, and the obtuse mammillary tip in the Australian, shell. And so with several others. None of these resemble living species, and they are accompanied by many others (as *V. Hannafordi* and *V. macroptera*, M'Coy) equally removed from any known living or fossil ones. In the same beds species of *Cypræa* are common, of the most extravagant forms when compared with any known living or fossil types. Thus one species, the *Cypræa gastroplax* (M'Coy), has the under side dilated into a flat circular plate between three or four inches in diameter. Another huge species, the *Cypræa gigas* (M'Coy), is commonly eight or nine inches in length, far exceeding any living species in size. Other *Gasteropods* are equally remarkable for representing fossil European species of the same age; thus the common *Cassidaria depressa* of the German lower miocene beds is so closely imitated by the *Cassidaria reticulospira* (M'Coy) in the Victorian strata, that the reticulation of the extreme apex of the spire is almost the only character for distinction. The common *Trivia avellana* of the European strata is represented by an equally common curiously similar species, the *T. avellanoides* (M'Coy). Amongst the singular forms in these Australian tertiary beds recalling oolitic European ones, is a *Pleurotomaria (P. Australis*, M'Coy) as large as the mesozoic *Pleurotomaria Anglica;* and a concentrically costated *Trigonia (T. semiundulata*, M'Coy) strongly contrasting with the radiated species which are alone found living now. The old notion found in many books that the marine oolitic fauna, as well as the terrestrial, exists still in Australia in the modern times, has no definite foundation when closely examined. The genus *Trigonia* has often been quoted as a case in point of a genus common in old world mesozoic formations, not occurring in the tertiaries, but found living in Australian waters. I have now described two tertiary Australian abundant species, the above one, and a radiated species, the *Trigonia acuticostata* (M'Coy) filling up the geological gap in the range in time of the genus, yet both perfectly distinct specifically from the four recent ones.

With these strange forms are abundance of a very small percentage of recent species, none of which, however, occur in Victorian waters, but in warmer seas, thus following the rule in this respect of recent species in miocene strata in Europe being usually recent in some warmer latitude. All our evidence, in fact, goes to show that there was no glacial period in Victoria succeeded by a warmer modern one, but that there has been a regular and gradual falling of the temperature to the present day.

The most abundant living shell in almost every locality of our Victorian miocene or oligocene beds is the *Pectunculus laticostatus* of the warm seas of North New Zealand, found in thousands, and perfectly identical with the living one, though having no relation to any found in seas of Australia. The *Cucullæa concamerata* and *granulasa* (Reeve) living in the warmer

seas of southern China, but not found living south of the equator, is not uncommon in the fossil state in our Victorian miocene beds. One of the commonest fossils in the same beds is the *Limopsis Belcheri*, previously only known as a very rare living species dredged from deep water off the Cape of Good Hope, where the Mozambique current heats the sea more than the latitude would account for. Almost equally common, however, and mixed with it, is the *Limopsis aurita* (Sassi), perfectly undistinguishable, on minute comparison of specimens, from examples from the Coralline Crag of Suffolk, and the miocene Fahluns of Flonheim, Rheinhessen, as well as with living specimens from the seas of the northern hemisphere. The only other excessively common living species of shell in our miocene or oligocene beds is the *Corbula sulcata* (Lam.) of the tropical seas of the west coast of Africa, whence I have procured living specimens, so that, as in the other cases of identity of species spoken of, I might not run the chance of misleading my readers by erroneous identifications based on comparisons with figures or descriptions only.

The *Brachiopoda*, although not very abundant, present many representative and peculiar forms, with one doubtful recent species; and another certainly identical with the very rare *Rhynconella lucida* (Gould), found living in the Sea of Japan. The *Echinodermata* are all extinct, and closely related to Malta species. The corals are few and all extinct, and peculiar to the locality.

MESOZOIC PERIOD.

It is generally supposed that no marine mesozoic strata occur in Australia. The announcement will therefore have some interest, that I have lately determined clearly the existence of the lower cretaceous rocks in nearly the centre of Australia, with the characteristic genera and closely representative species of the corresponding beds in Europe.

CRETACEOUS PERIOD.

From the head of the Flinders River Messrs. Carson and Sutherland have forwarded me specimens of an olive-coloured argillaceous and sandy rock, containing two large species of *Inoceramus (I. Carsoni* and *I. Sutherlandi*, M'Coy), so nearly agreeing in size and shape with the English cretaceous *I. mytiloides* (Sou.) and the English and French *I. Cuvieri* respectively, that at first sight they might be readily confounded. With these are two species of *Ammonites*—one *(A. Flindersi*, M'Coy) so closely agreeing in size, number of whorls, shape, markings, and septa with the common *Ammonites Beudanti* (Br.) of the French lower chalk, that, except for being slightly less compressed and a slight difference in some of the septal lobes, it could scarcely be separated, even as a variety.

With these is a Belemnite *(Belemnitella diptycha*, M'Coy) so exactly like in size and shape the *Belemnitella plena* of the English and French lower cretaceous rocks that they can only be distinguished by a slight difference in the distance of the two great longitudinal furrows.

The most wonderful occurrence which I am able to announce along with those molluscan forms are three new species of *Enaliosaurian* reptiles of cretaceous genera, and most nearly allied to cretacean European species. One of these is an *Icthyosaurus (I. Australis*, M'Coy), of which I have

recognised a large number of vertebræ, the large skull, with the eye and its bony sclerotic perfectly preserved, and part of one of the paddles. The other two are species of *Plesiosaurus*—one (*P. macrospondylus*, M'Coy) differing from the nearest known species in the greater proportional length of the bodies of the vertebræ, and the other (*I. Sutherlandi*, M'Coy) more nearly approaching the ordinary proportions of the genus and the New Zealand species of Owen.

LOWER MESOZOIC.

The coal-bearing rocks of Victoria belong, I have no doubt, to the mesozoic period, from the characteristic plants being such as are found with the mesozoic coal in Yorkshire, Germany, &c., and from the total absence of all the genera characteristic of the palæozoic coal. At Cape Paterson and Bellerine we find in the shales alternating with the coal three well-marked species of *Zamites* (*Z. ellipticus* and *Z. Barklyi*, M'Coy), and a rarer species (*Z. longifolius*, M'Coy), which I have seen from the N.S.W. beds; a *Tæniopteris* (*T. Daintrei*, M'Coy), of the size and shape of the *Tæniopteris vittata* of the English oolitic coal-beds, but differing in the number of transverse veins in a given space; and the *Phyllotheca Australis*, identical with the New South Wales coal species. The association of these genera alone would indicate the beds to be mesozoic and not palæozoic with certainty, but the association of the same plants with other species in other localities furnishes much additional interesting information. Thus, the *Phyllotheca Australis* is found with the *Glossopteris Browniana* in the New South Wales coal-beds of the Hunter River, so that, although the latter plant has not yet been found in Victoria, it is by this association brought to bear on our beds. Then again I have found the *Tæniopteris Daintrei* associated in New Zealand with a new species of *Camptopteris* (*C. Novæ-Zealandiæ*, M'Coy); and thus by this association we get yet another mesozoic genus of plants to support the view of the mesozoic age of the Victorian coal. Besides these generic forms, so unlike those of palæozic coal, there are numerous species of *Pecopteris*, *Neuropteris*, *Sphenopteris*, and other genera having a greater range in time, and as generic forms, therefore, of no interest in the discussion of the age of our coal-beds; but the species are generally nearly related to the Burdwan and Rajmahal coal-beds in India, and the Scarborough ones in the oolitic series of England. One of these, found commonly near Bellerine, the *Pecopteris Australis*, I have recently compared carefully with specimens of the English oolitic *Pecopteris Whitbiensis*, and am convinced that there is no specific character to separate the Australian fossil, which at most can only rank as a slight variety incapable of definition. The Indian beds of Rajmahal, so closely related to the Australian coal deposits near Sydney, are now I believe satisfactorily connected with the marine mesozoic beds of that country containing oolitic *Ammonites*, *Belemnites*, &c.

It is worthy of note that the collections illustrative of the coal deposits of New South Wales sent to the Intercolonial Exhibition by the Rev. W. B. Clarke and Mr. Keene, having been carefully examined by myself in company with Mr. Selwyn, entirely fail to give the slightest support to the view of those gentlemen that the plant-beds and coal are there palæozoic, as there is no trace of the *Sigillaria*, *Stigmaria*, *Calamites*, &c., said to be so abundant. The fish have the *facies* of Permian or Triassic forms rather than of car-

boniferous, of which period the characteristic abundant forms *Psammodus*, *Cochliodus*, *Ctenoptychius Gyracanthus*, *Rhizodus*, &c., are as completely absent as the palæozoic plants in the plant-beds. Both in New South Wales and Victoria a *Lepidodendron* occurs, *but in beds* entirely below those we are speaking of. I some years ago determined the oolitic age of some marine fossils, including *Pentacrinites*, *Belemnites*, *Ammonites*, &c., which had been sent from New South Wales localities to Mr. Clarke, and by him transmitted to His Excellency Sir H. Barkly, for my "opinion as to the geological epoch to which they belonged."

The sandstones of Bacchus Marsh, probably inferior in position to the coal-beds, contain one plant often of the size, shape, and reticulated neuration of the *Glossopteris Browniana*, but without the midrib. For these I have proposed the name *Gangamopteris*, and of this generic form a species, *G. Augustifolius* (M'Coy), occurs in New South Wales coal plant beds along with the *Glossopteris Browniana*.

In all the marine Australian mesozoic fossiliferous beds which I have seen, the genus *Trigonia* is absent.

TRIASSIC AND PERMIAN PERIODS.

I was able to suggest the existence of Trias deposits in Australia from the muschelkalk genus *Myaphoria*, which I recognised in some fossils from Wollumbilla sent by Mr. Clarke; and the Permian I suggested to exist at Mantuan Downs, also in New South Wales, from the *Productæ* and *Aulesteges* of that period submitted to me in the same collection.

CARBONIFEROUS PERIOD.

The sandstones of the Avon in Gippsland are the only traces of this formation that I can recognise in Victoria, and the only fossil I have seen from it is the *Lepidodendron*, referred to above, identical with that recognised by me many years ago from New South Wales, and which I have lately seen also from Queensland.

DEVONIAN PERIOD.

It is with great pleasure I announce the fact of my having been able satisfactorily to determine the existence of this formation also in Australia, the limestone of Buchan in Gippsland containing characteristic corals, Placodermatous fish, and abundance of the *Spirifera lævicostata*, perfectly identical with specimens from the European Devonian limestones of the Eisel.

UPPER SILURIAN PERIOD.

I have been able to recognise the Mayhill sandstones and the Wenlock rocks with certainty in many localities in Victoria. At Broadhurst Creek, for instance, the beds are filled with numbers of the *Phacops (Odontochilæ) longicaudatus* exactly as the corresponding English beds of Cheny Longville are in Shropshire; and here, as in every part of the northern hemisphere, the *Spirigera reticulata* is the commonest Brachiopod, and many others identical with species of England, Bohemia, and North America occur with it.

The Ludlow rocks are indicated by the *Orthoceras bullatum* and a series of starfish closely representing those of the English Ludlow beds, together

with a beautiful new *Homalonotus (H. Harrisoni*, M'Coy), which I have named after the discoverer, as well as the *Graptolites Ludensis*. The *Hemithyris diodonta* (Dal.) is as abundant in the Mayhill sandstone of Victoria as in the corresponding English beds at Malvern, and the same appearance of oblong smooth *Pentamerus (P. Australis*, M'Coy) mark this sandy base of the upper silurian in Victoria as in England and Wales, and North America.

CAMBRIAN PERIOD OF SEDGWICK, LOWER SILURIAN OF MURCHISON.

It is to this period that I have been able without hesitation to refer the whole of the slates containing gold quartz veins or reefs in Victoria, and all the slates containing these gold-bearing veins are identical in age and character with those of North Wales, in which the Romans worked the gold mines of Gogo Fau.

Not only are the majority of the fossil *Graptolites* found in the Welsh Llandeilo Flag, and of the corresponding Cumberland and Scotch slates, also found in those beds in Victoria, but we have in these formations the most extraordinary proof of the unexpected fact which I announced on a former occasion, that there was in the Cambrian or lower silurian period a nearly complete specific uniformity of the marine fauna, not only over the whole northern hemisphere, but across the tropics, extending to this remote temperate latitude of the southern hemisphere.

In the slates of the goldfields the principal fossils are *Graptolites*, and, what is very extraordinary, I have identified specifically here nearly the whole of the series of remarkable compound *Graptolites* first made known from the similar slates of Canada by the researches of Professor Hall. Many of the species have not yet been recognised in any but the Canadian localities in the northern hemisphere, and to find nearly the whole series here is most interesting, as their powers of locomotion could only be exercised in the short ovarian and free stage, so that, except on the supposition of a uniform marine fauna at this earliest zoological period of the earth's history, we could scarcely account for this width of distribution, and still less so of the littoral or shallow-water mollusca which accompany them in other beds. The *Diplograpsus mucronatus* (Hall), so common in the Utica slates of New York, I find in equal abundance here in the slates of Bendigo or Sandhurst, and with it abundance of the *D. quadrangularis* (M'Coy) completely identical with those I described many years ago from the slates of Dumfriesshire. The *Diplograpsus pristis* (His. sp.) also occurs in these same slates, mixed with the others as in Sweden, Bohemia, and Scotland, but in certain different sandy beds it covers the whole of the planes of deposition in millions, to the exclusion of everything else, exactly as it does in certain beds of the English caradoc sandstone near Church Stretton. In some localities these are replaced by great numbers of the Bohemian *Diplograpsus palmeus* (Barrande), on the upper end of many specimens of which I find a large smooth pear-shaped or heart-shaped appendage, which I believe to be an ovarian vesicle. I should remark that I have observed exactly the same appendage (bearing out, I think, the idea which I have supported formerly on other grounds,* of the affinity of the *Graptolites* with the *Hydroida)* in specimens of this species from the slates of the typical locality in Bohemia, when carrying out the direct

* British Palæozoic Rocks and Fossils.

careful comparisons of specimens of species, which I state to be identical in Victoria and other countries; so the frequent observation of this apparent ovicell in the Victorian specimens does not at all affect the identity of this species with that of the basin of Bohemia, of which there can be no doubt. The *D. ramosus* (Hall) is also in our slates identical with those of the Utica slate of New York. Of the group of compound Canadian *Graptolites*, the commonest in the Victorian goldfield slates of many localities is the *Didymograpsus caduceus* (Salt.) first described from the Quebec slates. In many localities the specimens of this species are as small as the first described Canadian ones, but in others they acquire a greatly increased size, occasionally twice the length and nearly three times the width, and the angle of divarication of the two branches varies from 5° to 70°. This is usually accompanied by the *D. serratulus* (Hall), identical with those of New York slates, and generally also by the very large Canadian *D. bryonoides* (Hall), which it is possible may be hereafter found to be the perfect development of my *G. latus*. The *D. nitidus* (Hall) is more rare, but perfectly identical with the Canadian types. The *Graptolites gracilis* (Hall), identical with the New York and Canadian species, is one of the rarer compound forms. The curious radiating compound forms, which created so much astonishment when published first by Professor Hall in his Decades of the palæontology of this part of Sir H. Logan's geological survey of Canada, I find in just as great abundance in the slates of the same age in Victoria. *D. octobrachiatus*, *D. quadribrachiatus*, and *D. Logani* (Hall) are, especially the latter, not uncommon in many of the goldfield localities. The curious Canadian quadrifid graptolite, named *Phyllograptus typus* by Hall, is one of our most abundant Australian graptolites; but, although sometimes upwards of an inch in length, small specimens, I find, on comparison with Swedish specimens of the *G. folium* of Hisinger, are perfectly identical therewith; and further, on carefully comparing Bohemian specimens of the *G. ovatus* of Barrande with the Swedish *G. folium*, I have no doubt they belong to one variable species, and are identical with the smaller examples of the Australian and Canadian species; and further, that the European specimens are truly quadrifoliate, like Hall's *Phyllograptus*; and in this way the difference in the different descriptions, as to the width of the midrib, becomes intelligible.

As a general rule, the graptolite slates in every part of the world contain no other fossils. I many years ago discovered in Wales, near Builth, the only shell I ever heard of in graptolite slates (the *Siphonotreta micula*, M'Coy), and I was greatly surprised to recognise it also in Victoria, in the Deep Creek section. The crustacean genus *Hymenocaris* is represented by a new species, *H. Salteri* (M'Coy), found in most of the graptolite slate localities.

In a different set of sandy, marly, and mud-stone beds—as at Woori Yallock, Yarra—we find an extensive series of the genera and many of the species of corals, Trilobites, and mollusca of the "Bala beds" of North Wales; species of *Favosites*,* *Palæopora*, *Calymene*, *Phacops*, *Beyrichia*, *Strophomena*, *Leptagonia depressa*, *Spirigera reticularis*, *Orthis*

* It is worthy of remark, that as on the continent of Europe the Devonian genus *Pleurodictyum* has now been found in silurian strata, so in those beds in Victoria I find a new species (*P. megastoma*, M'Coy), with cells half an inch in diameter.

elegantula, the characteristic little genus *Cucullella*, *Murchisonia*, *Cornelaria*, &c.; and some species new, and some identical with British ones, forming a group so completely reproducing the well-known Bala beds as to afford a second case in support of the view of the general specific identity of the marine fauna over both hemispheres of the whole world in the earliest palæozoic times.

It is curious that I have not yet seen any trace of the genus *Trinucleus* in Australian beds, nor *Ampyx*, while all the above-mentioned genera of Trilobites, with *Acidaspis*, *Chirurus*, &c., are well marked.

I can scarcely close this part of the subject without drawing attention to the curious confirmation offered in Victorian geology of the view of Professor Sedgwick and myself, that there was a real systematic line of divisions between the upper silurian and the Cambrian and lower silurian, at the base of the Mayhill sandstone, and over the Caradoc sandstone—the Mayhill sandstone which we first defined and demonstrated to have upper silurian fossils only, and the true Caradoc sandstone full exclusively of lower silurian or Cambrian types; the previous confusion of these two sandstones, from the mingling erroneously of their fossils in collections, having given Sir Roderick Murchison the erroneous impression that his upper and lower silurian groups of fossils (the distinctness of which he himself was the first to point out) were mixed together in the Caradoc sandstone, and that consequently the Bala beds, identical in fossils with those of the Caradoc beds (although formerly recognised by him as the type of the Cambrian system), could not be separated palæontologically from the upper silurian group. The Mayhill sandstone was one of the first formations I recognised on landing near Melbourne, with the usual upper silurian fossils; and it is now found here, as in Wales, to be slightly unconformable to the Cambrian or lower silurian, forming the obvious base of the former, and totally distinct in fossils from the latter.

INTERCOLONIAL EXHIBITION ESSAYS, 1866-67.

No. 8.

NOTES

ON

THE CLIMATE OF VICTORIA.

By ROBERT L. J. ELLERY,

GOVERNMENT ASTRONOMER OF VICTORIA.

NOTES

ON

THE CLIMATE OF VICTORIA.

A GENERAL idea of the climate of any country may sometimes be derived simply from its geographical position, especially when its isothermal, isotheral, and isocheimonal lines have been established. There are neverthe-less conditions peculiar to every locality or every position of a country, dependent on the conformation of the coast lines, the relation of oceanic currents therewith, the trend and altitude of mountain ranges, which give rise to variations, within whose limits may be comprised climates of very different latitudes; so that some acquaintance with the physical aspect of a country becomes almost essential to a clear comprehension of the character of its climate. It will be well, therefore, to preface the following brief notes on the climate of Victoria with a rough sketch of the more prominent physical features which characterise that portion of Australia.

The colony of Victoria, which has an area of about fifty-six millions of acres, occupies the south-east portion of Australia, and may be said to be included between the parallels 30° and 39° south latitude, and the 141st and 148th meridians. The whole southern boundary is formed by the waters of Bass's Straits, which separate Tasmania from Australia; the northern boundary consists of the River Murray; on the west it is limited by a marked line approximately coinciding with the 141st meridian; while on the east it is separated from the adjacent colony of New South Wales by an imaginary line running N. 40° W. from Cape Howe to the Murray. Its seaboard, lying generally east and west, extends over about 500 miles.

By an examination of a contoured plan of the colony, we find that the most prominent feature is an extensive mountain range running approximately east and west, rising somewhat abruptly about Lat. 37° 30′ and Long. 141° 40′, varying in altitude from 1000 to 5000 feet, and culminating in the N.E. in Lat. 36° 30′, Long. 148° 20′, at Mount Kosciusko, the highest part of the Australian Alps, where it

attains an altitude of over 7000 feet. The higher parts of this range are covered with snow for several months in the year. The mountain country is for the most part densely wooded with fine timber, even to the very summits; at some of the higher elevations, however, especially in the N.E., many of the peaks are quite bare, or only partially covered with dwarfed trees or shrubs. The country north and south of this great dividing range is moderately undulating or flat, consisting often of large plains, in some parts quite destitute of trees, but closely wooded in others. Along some parts of the coast line, however, especially in the Cape Otway, Western Port, and Wilson's Promontory districts, the land rises to considerable altitudes (from 2000 to 3000 feet) by ranges generally well covered by timber to their summits. On the whole the country is not well watered; the rivers are few and insignificant, and are often nearly dry in summer; there are several lakes, both salt and fresh, in different parts, but not of sufficient extent to have any marked influence on the climate. The coast line itself is for the most part comparatively flat, with a moderate elevation; although, as just stated, at some places lofty ranges abut on to the sea, and the coast becomes precipitous and rugged.

An extensive sea-board, open to polar winds and oceanic currents, modified, no doubt, by the presence of the Island of Tasmania; an extensive and wooded mountain range running across the whole breadth of the colony the higher portions of which are often clothed in snow; and the generally arid sub-tropical Australian interior, dominating on its northern and western boundary—must each necessarily exercise considerable influence in producing conditions of climate varying with the locality.

For many years past the Colonial Government has maintained a system of Meteorological Stations in various parts of the colony, of which the Melbourne Observatory forms the centre; and regular observations of temperature, pressure of air, humidity, radiation, rain, &c., have been obtained for longer or shorter intervals at each. These stations are distributed so that nearly all districts possessing any climatic peculiarity are represented, with the exception, perhaps, of the higher altitudes in our mountain districts, and the arid plains in the north-west. They are here enumerated:—

	Lat. South.	Long. East.	Elevation above Sea Level.
Melbourne	37° 50′	144° 59′	91 feet
Ballarat	37° 34′	143° 49′	1438 ,,
Sandhurst	36° 47′	144° 17′	778 ,,
Beechworth	36° 20′	146° 43′	1783 ,,
Portland	38° 20′	141° 35′	37 ,,
Cape Otway	38° 54′	143° 31′	300 ,,
Port Albert	38° 39′	146° 41′	30 ,,
Gabo Island	37° 35′	149° 55′	40 ,,
Ararat	37° 18′	142° 58′	1072 ,,

In Melbourne, observations have been systematically recorded for the last nine years; in Ballarat, Sandhurst, and Portland complete records have been made since 1858, with some interruptions in the two last-named stations; at other stations observations for shorter periods, from one to five years, have as yet only been obtained. The results of these,

however, are sufficient to establish many of the most prominent characteristics of our climate, and are now annexed in order.

TEMPERATURE.

As temperature is undoubtedly the chief meteorological element upon which climate depends, it will first engage our attention. Appended are tables giving the mean monthly and annual temperatures for the various stations, as well as tables of maxima, minima, and range, both of air and soil, and of solar and terrestrial radiation.

TABLE I.—MEAN MONTHLY AND ANNUAL TEMPERATURE FOR THE VARIOUS METEOROLOGICAL STATIONS IN VICTORIA.

STATIONS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean Annual Temp.
Melbourne ..	66·9	65·1	64·4	59·0	53·3	49·0	47·8	50·0	53·4	57·2	61·5	63·5	57·6
Portland ..	66·9	66·5	66·0	62·8	57·6	54·5	53·2	54·8	57·6	60·6	63·1	64·2	60·7
Cape Otway	60·6	60·3	59·9	57·7	53·6	50·9	49·4	50·3	51·2	53·4	56·8	58·1	55·2
Port Albert..	65·3	63·4	62·4	56·5	52·7	48·9	47·0	50·0	53·8	55·8	60·8	60·2	56·4
Gabo Island	65·1	64·7	65·7	62·1	57·4	53·5	51·4	52·5	55·0	57·4	59·2	62·1	58·8
Ararat ..	70·7	67·9	65·7	57·6	51·6	47·1	46·4	49·1	51·1	57·4	63·2	67·6	58·0
Ballarat ..	63·3	61·6	61·1	54·5	48·2	45·1	42·6	45·5	47·5	52·7	57·9	59·8	53·3
Sandhurst ..	70·8	68·8	67·2	59·5	52·0	47·5	45·5	48·4	51·8	58·2	65·7	66·8	58·5
Beechworth	70·4	69·5	68·0	58·3	49·0	46·1	40·8	45·4	47·2	58·9	65·6	67·0	57·2

TABLE II.—SHOWING THE MAXIMA, MINIMA, AND RANGE IN TEMPERATURE OF AIR, AT THE FOLLOWING STATIONS, DURING A PERIOD OF EIGHT YEARS (1858—1865).

MONTHS.	MELBOURNE.				PORTLAND.				SANDHURST.				BALLARAT.			
	Max	Min.	Greatest Monthly Rge.	Mean Monthly Rge.	Max.	Min.	Greatest Monthly Rge.	Mean Monthly Rge.	Max.	Min	Greatest Monthly Rge.	Mean Mon'hly Rge.	Max	Min.	Greatest Monthly Rge.	Mean Monthly Rge.
January... ...	111·2	44·9	66·3	53·8	108·0	43·0	65·0	51·4	117·4	41·5	75·9	58·8	100·0	39·3	60·7	56·2
February ...	104·0	40·3	63·7	52·1	103·0	39·0	64·0	50·5	104·6	46·0	58·6	54·0	100·1	36·2	63·9	57·2
March	98·6	43·0	55·6	48·5	100·0	41·0	59·0	49·2	99·0	42·0	57·0	47·4	98·0	37·0	61·0	59·5
April	94·0	35·1	58·9	44·0	85·0	36·0	49·0	40·1	93·0	39·0	54·0	42·2	86·8	31·2	55·6	45·0
May	76·2	38·7	42·5	33·4	78·0	31·0	47·0	35·0	72·0	35·0	37·0	34·3	69·0	30·5	38·5	34·6
June	68·1	32·0	36·1	29·1	69·0	31·0	38·0	32·0	66·5	31·0	35·5	30·4	66·3	27·5	38·8	30·6
July	64·8	29·0	35·8	28·8	68·0	31·0	37·0	30·7	62·0	28·5	33·5	29·0	61·0	22·0	39·0	29·7
August	73·8	28·3	45·5	34·5	78·0	30·0	48·0	35·1	73·[illegible]	31·0	42·0	34·1	71·1	27·4	43·7	33·9
September ...	85·0	33·0	52·0	41·3	79·0	32·0	47·0	38·6	79·8	33·5	46·3	39·9	82·4	28·8	53·6	40·8
October... ...	91·1	33·4	57·7	45·5	89·0	35·0	54·0	43·6	93·2	35·0	58·2	48·1	89·4	32·4	57·0	46·8
November ...	103·2	39·5	63·7	52·0	100·0	37·0	63·0	49·7	99·8	38·5	61·3	54·6	98·2	33·0	65·2	56·4
December ...	107·2	43·7	63·5	50·8	104·0	37·0	67·0	52·3	104·5	41·0	63·5	55·0	102·4	31·2	71·2	56·2
Greatest Range (During the above period.)	82·9	..	..	..	78·0	..	..	..	88·9	..	..	..	87·0	..	..	..
Mean Yearly Range (During the above period.)	70·0	..	..	..	64·6	..	..	..	73·6	..	..	..	70·5	..	..	..

TABLE III.—TEMPERATURE OF SOIL AT MELBOURNE.

Months.	Mean Temperature of Surface Soil during a period of 8 years, 1858-1865.	Ground Thermometers at the following Depths during a period of 5 years, 1861-1865.											
		14 Inches Deep.			3 Feet Deep.			6 Feet Deep.			8 Feet Deep.		
		Mean Temperat.	Mean Range.	Greatest Range.	Mean Temperat.	Mean Range.	Greatest Range.	Mean Temperat.	Mean Range.	Greatest Range.	Mean Temperat.	Mean Range.	Greatest Range.
January	75·8	70·9	9·2	17·2	69·1	4·1	10·1	67·1	3·0	8·2	64·1	2·8	6·1
February	73·8	69·9	7·8	15·6	69·4	3·7	9·1	68·4	1·2	7·1	65·9	1·4	5·4
March	69·8	68·0	10·0	17·9	67·5	4·3	9·4	67·7	1·9	7·1	66·2	0·8	5·5
April	61·4	61·8	10·1	16·8	63·7	6·1	10·5	65·0	3·5	8·8	64·8	2·1	6·6
May	53·5	54·9	7·4	12·0	57·3	6·4	9·1	60·3	4·3	7·9	61·8	3·2	4·8
June	48·9	50·3	5·8	8·4	52·2	4·2	8·4	56·1	3·7	8·0	58·2	3·5	6·8
July	47·6	48·3	4·2	7·5	49·6	2·7	6·0	53·2	2·1	5·8	55·2	2·7	6·8
August	50·8	49·0	6·3	9·4	49·3	3·5	6·4	52·0	1·6	4·6	53·3	2·0	6·5
September	55·8	53·0	6·6	10·6	52·4	4·9	7·2	58·6	2·4	4·5	53·9	1·1	3·0
October	61·7	57·9	9·4	16·5	57·1	5·9	10·8	56·7	3·4	6·7	55·9	2·4	4·3
November	68·9	63·3	9·7	14·4	61·4	6·5	12·4	60·2	3·7	7·3	58·4	2·6	4·7
December	72·3	66·4	9·1	18·4	65·1	4·1	8·6	63·5	2·7	6·5	61·1	2·8	5·0
Mean for the year ...	61·6	59·5	7·9	..	59·5	4·7	..	60·3	2·8	..	59·9	2·2	..
Mean yearly range ...	..	..	30·8	..	..	23·4	..	..	17·1	..	..	14·5	..
Greatest yearly range	..	..	..	37·2	..	..	29·0	..	..	22·9	..	..	20·4

TABLE IV.—TEMPERATURE OF SOLAR AND TERRESTRIAL RADIATION AT MELBOURNE, DURING A PERIOD OF 7 YEARS (1859 TO 1865).

Months.	Radiation.		Radiation.		Difference between Solar and Terrestrial Radiation.	
	Highest Solar	Lowest Terrestrial	Means of highest Solar	Means of lowest Terrestrial	Greatest	Mean
January	144·3	40·0	108·5	52·9	104·3	55·6
February	133·0	38·1	106·2	52·3	94·9	53·9
March	126·7	38·1	103·9	51·5	88·6	52·4
April	136·2	29·4	94·9	47·2	106·8	47·7
May	127·5	29·0	84·1	43·2	98·5	40·9
June	94·8	28·5	78·6	40·2	66·3	38·4
July	90·0	23·0	76·5	37·8	67·0	38·7
August	98·8	24·0	84·6	38·4	74·8	46·2
September	105·3	29·0	91·6	41·1	76·3	50·5
October	116·6	27·5	96·3	44·4	89·1	51·9
November	126·1	33·2	103·2	46·9	92·9	56·3
December	132·2	35·8	104·4	49·4	96·4	55·0
Greatest difference during the above period					121·3	—

From these tables the following facts may be derived:—The mean annual temperature of Melbourne is 57°.6, which approximately represents that of the colony generally, namely, 57°. The highest mean occurs at Portland and at Gabo Island, both coast stations (the latter forming the south-eastern extremity of New Holland), while the lowest occurs at Ballarat. There can be little doubt that the high means at Portland and Gabo Island are caused by the neighbourhood of warm ocean currents, for although the annual mean temperature of most stations on the coast are high, these, and more especially Portland, appear above the average. The low mean at Ballarat is also due to the altitude of the station on the dividing range, which is 1438 feet above the sea.

The annual mean temperature which obtains at Melbourne places it within the same isotherms in the Southern Hemisphere as Lisbon,

Madrid, Marseilles, Florence, &c., in the Northern Hemisphere. The ranges of temperature between summer and winter months, however, appear to be much less than at most of these places, and a more equable temperature may be assumed to exist in Melbourne than at similar isotherms in the south of Europe. As regards the extremes and range of temperature at the various localities, Table II. informs us that the highest temperatures in the shade occur at Sandhurst in January, namely, 117°, while Melbourne reaches 111°. There are, however, localities in which even higher temperatures rule in the same month, especially on the plains north of the Dividing Range and along the banks of the Murray, between latitudes 34° and 36° 30′, in which localities the temperature has often been as high as 123° to 125° for several days together. It is during the hot winds to which this climate is subject in summer that our highest temperatures occur, but they seldom last many hours, and are usually rapidly followed by a change in direction of the wind, and by a comparatively low thermometer, when a fall of 20° to 25° often occurs in as many minutes.

The minimum temperatures occur in June, July, and August—the lowest yet known in Melbourne being 28°.3, or 3°.7 below freezing point; at Portland, 30°; at Sandhurst, 28°.5; and at Ballarat, 22°, or 10° below freezing.

Table IV. exhibits the results of observations on terrestrial and solar radiation obtained in Melbourne, the only station at which they have been systematically made. With respect to the solar radiation it may be well to mention that the black bulb thermometer hitherto used has its bulb made of black glass, but not otherwise rendered opaque. From the experiments of many physicists, however, it appears that the black glass used is seldom sufficiently opaque to give true results; a trial was, therefore, made with a second thermometer with its glass bulb blackened by a good thick coat of lamp black, and a considerable increment of temperature was obtained from solar radiation, especially at the periods of maxima. From this comparison it appeared that all the maxima of solar radiation hitherto obtained should be increased by 12°, to give results comparable with other observations made with the *blackened* black bulb thermometer.

The temperature of the soil has been obtained at Melbourne only. The results are given in Table III., from whence it will be found that the greatest yearly ranges for the several depths are—for 14 inches, 37°.2; three feet, 29°; six feet, 22°.9; and eight feet, 20°.4; while the mean temperatures in the same order are 59°.5, 59°.5, 60°.3, and 59°.9.

The following table or Thermic Wind-rose will show the mean temperatures for the various directions of the wind in winter and summer:—

	Winter. °	Summer. °
S.	49·40	68·98
S. E.	47·63	61·27
E.	50·10	65·02
N. E.	43· 0	68·09
N.	50·37	75·26
N. W.	47·38	62·67
W.	49·09	58·85
S. W.	50·07	63·34

HUMIDITY.

Next in importance among the meteorological elements as regards climate is probably that of humidity. The results obtained from hygrometrical observations at the various stations are here given in Table V.

TABLE V.—MEAN RELATIVE HUMIDITY FOR DIFFERENT STATIONS.

STATIONS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean Annual Humidity.
Melbourne..	0·64	0·67	0·67	0·73	0·77	0·82	0·81	0·76	0·72	0·70	0·64	0·65	0·72
Portland ..	0·76	0·78	0·74	0·80	0·84	0·84	0·84	0·84	0·80	0·76	0·80	0·78	0·80
Cape Otway	0·86	0·86	0·89	0·84	0·85	0·86	0·86	0·83	0·85	0·88	0·83	0·85	0·85
Port Albert..	0·73	0·75	0·75	0·80	0·79	0·82	0·84	0·83	0·79	0·81	0·78	0·80	0·79
Gabo Island	0·89	0·90	0·91	0·91	0·90	0·91	0·91	0·91	0·93	0·94	0·89	0·88	0·91
Ararat ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ballarat ..	0·62	0·62	0·66	0·76	0·85	0·86	0·87	0·82	0·80	0·74	0·68	0·67	0·75
Sandhurst ..	0·50	0·54	0·60	0·70	0·77	0·83	0·82	0·74	0·70	0·62	0·51	0·50	0·65
Beechworth	0·63	0·50	0·54	0·60	0·75	0·74	0·80	0·75	0·72	0·61	0·55	0·55	0·65

The mean temperature of the dew point at Melbourne for each month has been found to be—

Sept. ...	43·5	...	Dec. ...	51·8	...	March ...	50·9	...	June ...	43·5
October ...	46·6	...	January	54·1	...	April ...	47·9	...	July ...	40·5
November	48·2	...	February	53·9	...	May ...	44·7	...	August ...	42·5
Spring ...	46·1	...	Summer	53·3	...	Autumn	47·8	...	Winter ...	42·2

giving a mean annual temperature of the dew point 47°.3.

The humidity of the air is subject to very great and rapid variations, especially during the summer months, when it is not at all unusual that it is reduced from 60 to 24 per cent. in a few hours; and frequently during the occurrence of hot winds, with a daily mean of 30 or 40 per cent., it has been reduced as low as 13 or 15 per cent. In such cases of minimum humidity, however, the daily mean or even an excessive humidity immediately follows the change of wind.

PRESSURE OF AIR.

The mean pressure of air in Melbourne from discussion of eight years' observation appears to be 29·925 inches; this, reduced to the sea level, becomes 30·016 inches. Tables VI. and VII. appended give the mean monthly and annual pressure, and monthly and annual range for the several meteorological stations in the colony.

TABLE VI.—MEAN PRESSURE OF AIR AT DIFFERENT STATIONS.

STATIONS.	Height above Sea-level in ft.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Mean.
Melbourne .	91	29·819	29·867	29·953	30·010	29·975	30·018	29·984	30·000	29·899	29·804	29·876	29·801	29·925
Portland . .	97	29·894	29·932	30·007	30·059	30·000	30·061	30·024	30·030	29·934	29·945	29·936	29·856	29·973
Cape Otway	300	29·682	29·714	29·789	29·809	29·700	29·834	29·674	29·768	29·673	29·697	29·681	29·642	29·722
Port Albert .	80	29·874	29·975	29·977	30·012	30·030	30·070	30·226	30·029	29·910	29·904	29·966	29·915	29·998
Gabo Island	40	29·770	29·832	29·951	29·978	29·969	29·942	29·992	29·968	29·878	29·789	29·796	29·798	29·869
Ararat . . .	1072	28·763	28·812	28·857	28·930	28·914	28·953	28·839	28·909	28·816	28·822	28·803	28·754	28·848
Ballarat . .	1438	28·435	28·467	28·558	28·596	28·549	28·575	28·549	28·563	28·482	28·485	28·470	28·410	28·511
Sandhurst .	778	29·098	29·133	29·230	29·294	29·276	29·289	29·248	29·287	29·176	29·151	29·139	29·061	29·198
Beechworth	1783	28·085	28·081	28·174	28·250	28·146	28·281	28·194	28·066	28·054	28·173	28·102	28·019	28·185

TABLE VII.—MEAN RANGE IN PRESSURE OF AIR AT DIFFERENT STATIONS.

STATIONS.	Height above Sea-level in ft.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean monthly range for year.
Melbourne	91	0·767	0·741	0·681	0·819	0·976	0·958	0·918	0·971	1·048	0·950	0·800	0·969	0·884
Portland ..	87	0·729	0·750	0·676	0·825	1·055	0·900	0·919	1·016	1·058	0·948	0·798	0·993	0·896
Cape Otway	300	0·849	0·698	0·700	0·765	0·984	1·068	1·138	1·060	1·094	0·954	0·782	0·876	0·914
Port Albert	80	0·729	0·781	0·896	0·786	0·932	0·959	0·775	1·012	0·893	0·872	0·806	0·967	0·862
Gabo Island	40	0·821	0·820	0·718	0·799	0·832	0·869	0·975	0·937	0·881	1·045	0·825	0·662	0·849
Ararat ..	1072	0·667	0·532	0·601	0·614	0·829	0·825	0·870	0·889	0·901	0·794	0·695	0·758	0·748
Ballarat ..	1438	0·635	0·687	0·546	0·721	0·907	0·855	0·811	0·876	0·892	0·806	0·652	0·818	0·762
Sandhurst	778	0·705	0·616	0·560	0·670	0·835	0·878	0·830	0·896	0·962	0·831	0·701	0·806	0·774
Beechworth	1788	0·488	0·618	0·619	0·590	0·815	0·722	0·648	0·895	0·784	0·783	0·552	1·177	0·724

The barometer is subject to very considerable oscillations, and sometimes in very short periods—the greatest occurring during storms from the W., S.W., and S.S.W. The greatest range yet observed, amounting to 1·719 inches, took place in 1863; the maximum, 30·587, occurring in September, and the minimum, 28·868, in December in the same year, during a violent storm from the west. The pressure, as influenced by the direction of wind, will be seen by the following table of mean pressures observed at Melbourne during winds from the various points of the compass :—

	Inches.		Inches.
S.	29·930	N.	29·821
S.E.	29·954	N.W.	29·840
E.	29·896	W.	29·854
N.E.	29·878	S.W.	29·835

The mean daily range in pressure of air for Melbourne, 120 feet, and for Ballarat, 1437 feet, above the level of the sea, is given in the table below.

	Melbourne. inches.	Ballarat. inches.
Spring	0·191	0·104
Summer	0·163	0·088
Autumn	0·157	0·092
Winter	0·152	0·098
Year	0·166	0·096

The mean daily range is greatest for Melbourne in September, and least in February; from which Ballarat seems to differ, in so far as there the greatest range occurs in August, the differences for these months being 0·056 and 0·032 inches respectively.

As a rule, the greatest pressure occurs with the wind from S. to S.E., and the lowest from N. to W. From discussion of many years' observation, there appears to be a maximum of mean pressure in the early part of August.

RAINFALL.

Although Victoria has generally been considered a dry climate, we find that the rainfall usually attains to the average of similar latitudes in other parts of the world; but it is doubtless to the large amount

of spontaneous evaporation, as well as perhaps to the immense tracts of unbroken surface soil, that the frequent inadequacy of our rainfall is due. In some localities, however, not only does the fall of rain reach a larger average, but, owing to sheltered and most frequently submontane positions, the evaporation is almost reduced to a minimum. This is particularly the case in the valleys and gullies at the foot of our mountain ranges, where the character of the vegetation is considerably modified thereby.

From observations of the rainfall carried on since 1840, but unfortunately with a break in the years 1851, '52, '53, and '54, we may assume the annual average to be 28·5. From Professor Neumayer's observations of spontaneous evaporation, it appears that it amounts to 45 inches per annum, and occurs principally during the spring and summer months; in winter and autumn the rainfall generally exceeds the evaporation by a considerable amount. It would thus appear that spontaneous evaporation exceeds the rainfall by 16 or 17 inches. The conditions that generally affect spontaneous evaporation can scarcely be brought to bear upon any of the methods of observation usually adopted, and determinations made from a small surface of water in an open position will, doubtless, give a result in excess of the average evaporation, and such, I think, we may assume to be the case in this instance; nevertheless, spontaneous evaporation in most parts of Victoria is greatly in excess of the rainfall.

In the tables appended, the annual rainfall for Melbourne, and other localities in which reliable observations have been made, is given for each year, as well as the number of days' rain and amount of rainfall for every month and each year in Melbourne from 1858 to 1865.

TABLE VIII.

Years.	Melbourne.	Heathcote.	Ballarat.	Portland.	Camperdown.	Beechworth.	Echuca.	Gabo Island.	Longerenong, Wimmera.	Ararat.	Sandhurst.	Cape Otway.
1840	22·57	—	—	—	—	—	—	—	—	—	—	—
1841	30·18	—	—	—	—	—	—	—	—	—	—	—
1842	31·16	—	—	—	—	—	—	—	—	—	—	—
1843	21·54	—	—	—	—	—	—	—	—	—	—	—
1844	28·26	—	—	—	—	—	—	—	—	—	—	—
1845	23·09	—	—	—	—	—	—	—	—	—	—	—
1846	30·53	—	—	—	—	—	—	—	—	—	—	—
1847	30·18	—	—	—	—	—	—	—	—	—	—	—
1848	33·15	—	—	—	—	—	—	—	—	—	—	—
1849	44·25	—	—	—	—	—	—	—	—	—	—	—
1850	26·98	—	—	—	—	—	—	—	—	—	—	—
1851	—	—	—	—	—	—	—	—	—	—	—	—
1852	—	—	—	—	—	—	—	—	—	—	—	—
1853	—	—	—	—	—	—	—	—	—	—	—	—
1854	—	—	—	—	—	—	—	—	—	—	—	—
1855	28·21	—	—	—	—	—	—	—	—	—	—	—
1856	29·75	—	—	—	—	—	—	—	—	—	—	—
1857	28·90	—	—	—	—	—	—	—	—	—	—	—
1858	26·02	28·79	24·47	27·30	27·97	30·87	—	—	—	—	—	—
1859	21·80	21·86	28·72	31·42	27·60	—	15·76	—	—	—	—	—
1860	25·40	29·01	28·80	26·31	29·97	—	19·13	32·82	17·26	—	—	—
1861	29·15	28·78	28·66	39·58	36·94	29·70	—	38·74	20·17	—	—	—
1862	22·08	16·99	23·50	31·01	26·15	26·94	—	—	—	23·35	18·50	—
1863	36·48	—	37·22	45·31	—	—	—	49·12	33·08	37·37	33·92	49·68
1864	27·40	—	24·[illegible]	33·06	—	—	—	—	—	—	23·03	38·82
1865	15·94	—	20·09	34·37	—	—	—	—	—	15·71	10·85	38·62
1866	22·41	—	23·35	31·75	—	—	—	—	—	18·21	21·41	34·29

TABLE IX.—SHOWING THE NUMBER OF DAYS OF RAIN AND THE AMOUNT OF RAINFALL FOR EVERY MONTH, AND FOR EACH YEAR, TOGETHER WITH THE AVERAGE NUMBER OF DAYS OF RAIN, AND AVERAGE AMOUNT FOR EVERY MONTH, FOR THE PERIOD FROM 1858 TO 1865.

FOR MELBOURNE.

Years.	January.		February.		March.		April.		May.		June.		July.		August.		September		October.		November.		December.		For the whole Year.	
	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.	Amount in inches.	No. of Days of Rain.
1858	0·88	9	4·91	12	1·09	9	0·60	11	1·38	15	0·76	13	2·07	18	1·61	16	2·17	[illegible]	0·87	10	3·19	11	6·47	12	26·02	158
1859	2·86	13	0·83	10	0·18	8	1·29	8	[illegible]	14	4·51	21	1·04	18	0·95	17	2·77	16	[illegible]	18	1·71	12	1·02	11	21·83	[illegible]
1860	1·97	10	1·07	4	0·96	6	4·52	12	0·99	11	1·72	16	1·21	9	0·79	10	2·72	17	1·97	15	2·88	12	[illegible]	11	[illegible]	[illegible]
1861	2·25	14	4·63	13	2·65	9	1·29	11	0·64	12	1·78	16	2·14	16	1·47	14	3·19	17	[illegible]	14	1·46	11	[illegible]	12	29·15	159
1862	1·25	4	0·19	8	1·08	8	3·56	14	4·31	19	[illegible]	16	2·26	20	1·95	14	0·98	14	2·08	11	0·32	9	1·16	7	22·08	139
1863	1·84	9	2·74	12	3·84	14	1·76	10	2·54	16	1·16	10	2·87	16	2·10	18	1·99	15	4·89	18	3·51	13	7·18	14	36·43	165
1864	2·07	7	2·63	9	[illegible]	7	4·53	18	1·02	9	0·61	10	2·83	13	2·50	18	2·28	14	4·06	18	0·61	9	2·21	12	27·40	144
1865	0·16	8	0·59	8	1·26	8	0·72	7	3·41	18	1·64	10	2·05	14	1·22	14	1·87	18	0·78	8	[illegible]	7	[illegible]	9	15·94	119
	1·66	8·6	2·20	8·9	1·61	8·6	[illegible]	11·4	2·10	14·2	1·92	14·0	2·06	14·9	1·57	15·1	[illegible]	[illegible]	2·73	13·4	[illegible]	10·5	[illegible]	11·0	[illegible]	147

By selecting Melbourne as the locality in which the most extended series of observations have been obtained, we remark that in the years 1848, 1849, and in 1863, the rainfall was far above the average; in 1864, 1865, and 1866 it fell below the average, especially 1865, when it only reached 15·9 inches. In 1848 and 1849 extensive and destructive floods occurred, and again in 1863; in 1865 and 1866 the country suffered from a severe drought; and the year 1851, following the heavy rains of 1849, was also a dry one, although the amount of rainfall, if ever observed, cannot yet be ascertained. An opinion has often been expressed that there is a periodicity in the excessive rainfalls and droughts in Australia generally; but although the above results may give some slight grounds for this supposition, a far greater number of years' observations will be necessary from which to deduce any law of this kind.

WINDS.

The alternation of the polar and equatorial currents of air constitutes the main feature of the prevalent winds, modified, of course, in the various localities by the physical features, and by their situation with regard to the mountain system. From discussion of the Melbourne observations, it seems evident the northerly winds have the ascendancy both in frequency and force, more especially during the winter months. S. and S.W. winds come next in force, and, generally speaking, in frequency also. The following table gives the results of frequency and velocity of the different winds for each month, as deduced from the records of the self-registering anemometer.

TABLE X.—SHOWING THE NUMBER OF HOURS THE WIND BLEW FROM THE DIFFERENT POINTS OF THE COMPASS, AND THE NUMBER OF MILES IT TRAVELLED, TOGETHER WITH THE MEAN NUMBER OF MILES FOR EACH POINT OF THE COMPASS, AND FOR THE WHOLE YEAR.

MONTHS.	N.		N.W.		W.		S.W.		S.		S.E.		E.		N.E.		Number of Hours of Calm.	Total number of Miles the Wind Travelled.
	Number of		Number of		Number of		Number of		Number of		Number of		Number of		Number of			
	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.	Hours.	Miles.		
January	42·5	511	14·8	95	38·5	495	130·8	1881	261·0	3746	137·0	1040	44·2	238	54·5	469	12·3	8480
February	58·7	699	31·2	444	36·3	353	111·0	1470	161·0	2094	135·7	1091	62·3	300	73·3	491	2·5	6941
March	102·0	1501	23·3	245	67 0	905	97·2	1370	161·8	1940	158·5	1330	35·8	230	95 2	739	3·2	8260
April	118·5	1322	45·3	465	72·9	778	85·7	991	91·8	910	63·5	854	22·9	100	163·4	1211	24·4	6132
May	180·8	3336	87·0	1166	153·5	2368	73·7	990	54·0	465	34·6	160	32·0	149	120·0	1010	9·3	9644
June	207·5	3338	90·8	[illegible]	125 5	1705	55 0	460	45 5	313	32·5	171	21·2	128	133·5	962	8·5	8278
July	189·0	2901	84 2	[illegible]	104·8	1148	70 0	617	54·5	468	69·5	600	27·8	149	140·3	1062	13·0	7677
August	159·7	2265	102·3	1315	99·5	1566	92 2	715	63·2	342	31·5	148	29·2	119	165 2	1347	1 0	7817
September	140·8	2572	93·2	1413	162·7	2348	105.3	1401	73·5	547	26·7	120	18.5	90	35·0	874	4·2	9365
October	91·7	1426	64·5	897	131·0	1570	149 7	2216	134·5	1567	55·2	[illegible]	21·8	123	79 8	650	15.8	8751
November	40·0	529	33·2	388	82·3	1190	155·2	2561	180·5	[illegible]	103·5	790	32·2	163	59·5	429	9 5	8371
December	42·5	571	26·0	338	98·2	1350	136·8	2413	203·5	2695	109 5	971	40·8	215	54 0	423	11·2	8975
Sums for the year..	1373·7	20971	697·8	8680	1172·2	15776	1291·6	17087	1484·8	17409	947·9	7075	388·2	1999	1233·7	9687	114 9	98691
Means for the year		15·3		12·4		13·3		13·3		11,7		7·5		5·1		7·9		11·3

NOTE.—Owing to temporary derangements of the instrument, registrations have been missed during 63 hours.
Winds between N.N.E. and N.N.W. are counted for N. Winds between N.N.W. and W.N.W. are counted for N.W., and so throughout.

CLOUD.

Table XI. shows the mean amount of cloud present for each month, at the several Meteorological Stations.

From discussion of the Melbourne observations respecting cloud, a minimum seems to occur at 9 p.m., and a maximum at 7 a.m., the averages being respectively for these periods 5·13 and 6·51. It further appears that the amount in day-time exceeds that in night-time.

TABLE XI.—MEAN AMOUNT OF CLOUD FOR DIFFERENT STATIONS.

STATIONS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean Annual Amount of Cloud.
Melbourne..	5·4	5·5	5·4	5·9	6·5	6·4	6·5	6·1	5·9	6·0	5·7	5·6	5·9
Portland ..	6·0	5·7	5·8	6·0	6·7	6·6	6·5	6·5	6·2	6·4	6·1	[illegible]	6·2
Cape Otway	6·5	6·2	6·8	6·5	6·6	6·9	6·7	[illegible]	6·9	6·8	6·0	6·1	6·5
Port Albert..	5·7	5·0	5·0	6·0	5·4	5·4	6·5	4·5	5·0	5·4	5·5	5·2	5·4
Gabo Island	4·6	5·5	4·8	4·7	4·1	5·2	4·9	4·8	4·8	5·0	5·7	5·1	4·9
Ararat ..	1·9	2·8	3·3	3·6	4·9	4·3	5·5	4·5	4·2	[illegible]	2·9	3·2	3·7
Ballarat ..	5·0	5·1	5·0	5·9	6·9	6·7	6·9	6·6	6·3	6·1	5·6	5·4	6·0
Sandhurst..	2·7	3·5	3·4	4·0	5·3	5·4	5·5	4·7	4·7	4·3	4·0	3·9	4·3
Beechworth	4·4	3·1	2·8	3·2	5·0	4·5	6·8	5·4	6·1	3·8	4·0	3·8	4·4

As regards the presence of ozone, or of ozonic reaction, it is now well established that this particular condition of the atmosphere is always at its maximum during strong south-west and south winds, and at its minimum during easterly and north-easterly winds; and, further, that its presence is evinced to a greater extent during the night than during the day.

The electric condition of the air seems, so far as observations have yet been made, to follow approximately the same variations as have been observed in other countries. During the hot dry winds prevalent here in summer months, and the dust storms that often accompany them, negative electricity prevails; this is also generally the case during heavy rains, frequently to a large degree. Positive electricity is usually observed as the wind springs up and increases after calm weather, and especially when the wind comes from the S. or S.W.

Although a moderately precise conception of the climate of this colony may be obtained from the foregoing remarks, there will yet remain much that modifies a climate, even to a large extent, which cannot be expressed in tables, or directly deduced from discussion of the various meteorological elements. A brief description, therefore, of a cycle of the seasons will, in connection with the tables already given, enable the reader to form a moderately correct idea of the climate of Victoria.

The Spring season, which may be said to include September, October, and November, generally sets in about the beginning of September; during which month, although slight frosts sometimes occur, the weather is usually mild and often quite warm. Rather above the monthly average of rain also frequently falls. Strong northerly and westerly winds are prevalent in September and October, but the currents of air, both as regards frequency and velocity, seem to be more equally distributed during these months than at other parts of the year. The northerly winds begin to assume the dry and

warm condition which characterises them throughout the summer months, and it is not at all unfrequent that quite a hot wind may prevail for a short period even in October; the weather generally, however, in September and October, is genial and pleasant. November, also representing the height of Spring, is usually characterised by fine, warm, and sometimes even hot weather. It is not at all unusual to get a large rainfall in October or November, sometimes giving rise to extensive floods; in some seasons, however, the rainfall after the commencement of October diminishes considerably, and frequent dry, and even hot, northerly winds in November parch the grass and other herbage, giving to the plains and hills a sand-like apppearance; but in others the pastures remain green till January, and in many parts of the colony, throughout the year.

The Summer season includes the months of December, January, and February. December is often marked by very changeable weather, and although generally hot and dry it is not unfrequently broken up by cold and stormy intervals, with heavy rains, and gales of wind. The northerly winds become more or less hot according to the amount and distribution of the rainfall throughout the interior during Spring. Very great changes of temperature often take place in a few hours; for instance, a warm north wind prevails in the morning, with a temperature reaching as high as 90° to 100°, a lull in the afternoon is quickly followed by a strong breeze from the S.W., and the temperature becomes reduced to 65° or 60° in fifteen or twenty minutes.

The highest mean temperature occurs in January; February also is often characterised by great heat and dryness. It is during these months that the northerly winds become perfect siroccos for short periods, and if the spring has been dry, extensive bush fires occur on the plains and in the forest, giving rise to a considerable increase of temperature, and superadding to the already unpleasant state of things a smoky and lurid atmosphere over considerable areas in the vicinity. Although unpleasantly hot weather very frequently intervenes throughout the summer months, yet a large and often the largest portion of the weather is fine and pleasant, with cool southerly or south-westerly winds.

The autumn season, including the months of March, April, and May, although subject to stormy weather, gales of wind, and large rainfall—especially in its earlier part, and following the equinoxes—may nevertheless be called the most genial and beautiful portion of the year. It constitutes a second spring, for so soon as vegetation receives the moisture it has thirsted for through the summer, the indigenous plants and trees put forth a growth that often exceeds that of spring. The temperature on the whole maintains a moderate mean; the northerly winds now become cooler, and solar radiation is considerably reduced; heavy dews fall at night, and sometimes towards the end of this season fog occurs during the night and early morning in very calm weather. In April the mean temperature becomes 59°, and in May 53°.

Winter includes June, July, and August. This season, though usually marked by frequent rain and strong winds, especially from the north, is in some years remarkably dry, with a small rainfall; the temperature does not reach its minimum till the middle of July and the beginning of August, and seldom in Melbourne falls much below freezing point. Ice and hoarfrost occur generally only on a very few occasions during

the winter in the neighbourhood of Melbourne, the former sometimes attaining a quarter of an inch in thickness. At higher levels, however, frost and ice have been observed as early as May, and forms much more frequently during the winter months than at the lower levels; the highest mountain summits too are in most seasons seen to be clothed in snow by June, and sometimes even as early as the beginning of May. The strongest winds in winter are usually from the north, from which quarter it often blows with great violence; wind from this direction is dry, and usually very cold at this season.

The worst vicissitude to which the climate of Victoria is subject in common with Australia generally is the occasional droughts; these as already stated appear to follow those years characterised by unusual rainfall; a fact that has given rise to a conjecture that both the excessively wet and excessively dry seasons are periodical. The last drought to which the colony was subject extended from the summer of 1865 till almost the winter of 1866, and was doubtless due to the small rainfall in the autumn and spring months.

The unsettled habits and irregular mode of life necessarily attendant on the rapid colonization of a gold-producing country, make it impossible at first to ascertain with certainty the effects of the climate on the health of the population. There can be no doubt that the character and severity of the prevalent diseases must be materially affected by the rapid vicissitudes of temperature, occasional extreme heat and low mean humidity; but on the whole there is every reason to believe that the climate of Victoria is one of the most salubrious in the world.

INTERCOLONIAL EXHIBITION OF AUSTRALASIA, 1866-7.

APPENDIX,

CONTAINING

DESCRIPTIVE AND STATISTICAL INFORMATION

RELATING TO THE COLONIES OF

NEW SOUTH WALES	TASMANIA
QUEENSLAND	NEW ZEALAND
SOUTH AUSTRALIA	WESTERN AUSTRALIA.

COLLECTED AND ARRANGED BY J. G. KNIGHT, F.R.I.B.A.

PREFACE TO THE APPENDIX.

In introducing the historical and statistical matter which constitutes a large portion of the present volume, it was felt that after the exertions made by the contributing colonies to promote the success of the first Intercolonial Exhibition of Australasia, it would be but fitting that some account of the resources of the several Provinces should be incorporated with the records of the enterprise. Unfortunately for the completeness of the work in question, the idea did not occur to the compiler until the printing of the volume was nearly completed, and as it was impossible to delay its publication until the required reports were officially furnished by the various Governments, it was resolved that such statistics and particulars as were at once obtainable should be embodied in the form herein presented.

Had time permitted, the records could doubtless have been made much more interesting and complete; but, even in their present form, it is believed that a greater mass of general statistical information with regard to the Australian colonies is aggregated in the present volume than has ever before been published in a collective form.

J. G. KNIGHT.

Melbourne, 1st June, 1867.

A DESCRIPTION

OF THE

NATURAL AND INDUSTRIAL PRODUCTS

OF

NEW SOUTH WALES,

AS FORWARDED TO THE

PARIS UNIVERSAL EXHIBITION OF 1867

By the New South Wales Exhibition Commissioners.

[Reprinted by the Commissioners of the Intercolonial Exhibition of 1866-7, in acknowledgment of the support rendered to their undertaking by the Commissioners of New South Wales.]

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A DESCRIPTION

OF THE

NATURAL AND INDUSTRIAL PRODUCTS

OF

NEW SOUTH WALES.

INTRODUCTION.

THE colony of New South Wales was founded by the Government of Great Britain, as a penal settlement, in the year 1788. Australia was then so far removed from all communication with the civilized world that it appeared to possess peculiar advantages in this respect. It seemed improbable that convicts could ever return from a country so distant. The voyage alone was so formidable that the boldest spirit might well quail in contemplating its length and its dangers. Colonel Collins, who came out in the "first fleet," felicitated himself and his companions on their landing in safety, in the following terms:—"Thus, under the blessing of God," he wrote in his history, "was happily completed, in eight months and one week (the whole fleet being safe at anchor on the 20th of January, 1788), a voyage which, before it was undertaken, the mind hardly dared venture to contemplate, and on which it was impossible to reflect without some apprehension as to its termination."

One thousand and forty-four persons embarked on this formidable enterprise. They consisted of 10 civil officers—a military guard, including officers, of 212 persons—their wives and families, 45 in number —81 other free persons—and 696 male and female convicts. These were mostly young persons from agricultural districts, few of whom had committed serious crimes. Of the number thus embarked, 1030 were safely landed on the shores of Port Jackson. The proportion of women among them is unknown, but it is supposed to have been under 300. The first fleet also brought several head of cattle, sheep, horses, pigs, goats, poultry, and a great variety of seeds and plants.

Such was the humble origin of settlements which now extend far into the interior of Australia, and some thousands of miles along its sea-board.

Only seventy-eight years have elapsed since the colony was founded, yet the city of Sydney now numbers over 100,000 inhabitants. From New South Wales have sprung the colonies of Tasmania, New Zealand, Victoria, and Queensland. The city of Melbourne—the capital of Victoria—contains 130,000 souls. The population of the British colonies in Australasia, taken collectively, is now not far short of 2,000,000. Their trade extends to every part of the world. Their exports and imports amount respectively to from £25,000,000 to £30,000,000 annually, and they have raised gold alone to fully the value of £200,000,000 sterling.

The history of the world presents no greater instance of successful colonization, nor a stronger illustration of national aptitude or genius in that direction. Colonies have been established and new cities have risen to magnitude in other parts of the world in a very few years, but perhaps in no other case have similar results been achieved at such a distance from any great centre of population.

The Australian colonists have brought with them not only the industry, enterprise, and energy, but also the institutions of their Fatherland. They prize its principles of self-government and jurisprudence; they cherish its traditional love of order and justice; and they hope, in themselves and their descendants, to maintain the genius of its people. And it is with no slight gratification that they now respond to the invitation of Great Britain to unite with her in representing the industrial resources of the British Empire in the Paris Exhibition of 1867.

To effect all the necessary arrangements for this purpose, the Governor, Sir John Young, appointed a Commission, consisting of the following gentlemen, namely:—

The Hon. W. M. Arnold, Speaker of the Legislative Assembly.
James Barnet, Esq., Colonial Architect.
George Bennett, Esq., M.D.
Hon. Alexander Campbell, M.L.C.
Rev. W. B. Clarke, M.A., F.G.S.
Fredk. Ebsworth, Esq.
Edward Flood, Esq.
John Hay, Esq., M.L.A.
E. S. Hill, Esq.
A. T. Holroyd, Esq.
J. F. Josephson, Esq., M.L.A.
Wm. Keene, Esq., F.G.S.
G. Krefft, Esq.
Walter Lamb, Esq.
James Macarthur, Esq.,
Hon. Sir Wm. Macarthur.
J. L. Montefiore, Esq.
Charles Moore, Esq.
T. S. Mort, Esq.
Hon. T. A. Murray, President of the Legislative Council.
J. N. Oxley, Esq.
Hon. H. Parkes, Colonial Secretary.
George Russell, Esq.
S. Samuel, Esq.
Professor Smith, M.D.
Hon. E. Deas Thomson, C.B., M.L.C.
R. Wisdom, M.L.A.
R. J. Want, Esq., and
John Windham, Esq.

Several of the Commissioners thus appointed applied themselves assiduously to the work entrusted to them. The Government aided them liberally with funds, and His Excellency Sir John Young did them the honour to attend their meetings on several occasions as a visitor, and aided them materially by his countenance and advice.

New South Wales abundantly possesses the raw materials of wealth, which it needs but capital and population to develope. She is rich in minerals of all kinds. Gold, silver, copper, iron, lead, and tin are scattered over the face of the country. Very little capital, however, has yet been applied to the production of these metals. There is reason to

believe that the auriferous deposits of this colony are as rich as those of Victoria, but the same skill and enterprise have not been applied in working them. A few copper mines are in successful operation; but the mass of the metallic wealth of New South Wales remains almost untouched. Coal is also plentiful, and already forms an important article of trade. Twenty thousand tons a week are raised at Newcastle alone—about sixty miles north of Sydney—and a considerable quantity is produced in the Illawarra District, about forty miles to the South. Kerosene shale has also been discovered in several places, and factories for extracting oil from it have been successfully established. Specimens of all these minerals have been forwarded for exhibition.

But the richness and extent of her pastures have as yet been the main source of the prosperity of New South Wales. There are now in all Australia about 30,000,000 sheep, 3,000,000 horned cattle, and 600,000 horses. Tallow, hides, leather, and preserved meats form important articles of export, but the production of fine wool seems still the great staple industry of the country. For this source of wealth the colonists are mainly indebted to the enterprise and energy of the late John Macarthur, Esq., of Camden Park, one of the earliest settlers. This gentleman was a captain in the 102nd regiment, with which he came to Sydney in 1790. Observing that the climate and pastures of New South Wales were eminently fitted for sheep-farming, he procured three merino rams and five merino ewes from the Cape of Good Hope, in 1797; and in 1803 he brought other sheep of the same breed from England, in a ship of his own, to which he gave the appropriate name of the "Argo." Thus originated those flocks of fine-woolled sheep which now in millions range the great pastures of Australia. The services of Mr. Macarthur in this respect have not yet had the public recognition to which they are evidently entitled, and must sooner or later receive. The Australian Colonies now export 100,000,000 lbs. of wool, of which about 30,000,000 are raised in New South Wales.

The land held in freehold in the colony amounts to 4,600,000 acres, of which 230,000 acres are under cultivation. Leasehold, however, is the general or principal tenure, about 120,000,000 of acres being held thus by Crown tenants, of which about 160,000 are under cultivation. Wheat, maize, barley, oats, rye, and tobacco are grown, but principally for home consumption. Extensive vineyards have been planted in various localities, and cotton and the sugar-cane are cultivated in the northern and warmer districts.

Arts and manufactures are comparatively in their infancy in New South Wales, but a profitable and promising commencement has been made in a great variety of articles.

Great attention was directed to Australia in consequence of the discovery of rich deposits of gold in New South Wales and Victoria, in 1851. The quantity since produced in both colonies, especially in Victoria, has been enormous, but it is difficult to discover what equivalent New South Wales has now to show for all she has raised and exported. It seems as if it had been mainly exchanged for perishable or consumable articles, which perhaps served the waste and luxury fully as much as the necessities of the moment. Her population—the great test of a nation's progress—has not advanced in a greater ratio than before.

The progress of the colony during the present century may be well illustrated by the following statistics :—

In 1803	the population consisted of	....	7,097
1821	,, ,,	....	29,783
1833	,, ,,	....	60,794
1840	,, ,,	....	129,463
1850	,, ,,	....	265,503
1851	(In this year Victoria separated)	....	197,168
1858	,, ,,	....	342,062
1859	(Queensland separated)	....	336,572
1866	,, ,,	....	420,000

The people of New South Wales possess all but plenary powers of legislation with respect to their local affairs. The Governor is appointed by the Crown, and has a right of veto upon all Bills, but this is never exercised when local interests alone are involved. There are two Legislative Chambers—a Legislative Council and a Legislative Assembly. The members of the former are nominated by the Crown for life; those of the latter are elected by the people. The qualifications for an elector are simply residence and registration, but the possession of land or houses also entitles the holder to a vote in any district in which they are situated. According to the statistical returns, few persons exercise the franchise. At the last general election, out of 120,000 electors only 44,000 voted; and at the preceding one, only 28,000 out of 107,000. The towns of the colony are in general quiet and orderly, but the country districts are occasionally much disturbed by bushrangers. On special occasions the citizens of Sydney may be seen assembled in crowds of 20,000 or 30,000, and nothing can be more orderly than their general bearing, nothing more pleasing than the contented well-to-do appearance they invariably present; and perhaps there is no seaport town in the world in which order and decorum are more observable than in the city of Sydney.

There is no dominant Church in New South Wales. State support has hitherto been granted to the principal denominations of Christians; and the Jews also have had an allowance, in recognition of their right as citizens in this respect. But an Act was passed by the Legislature, in 1862, whereby Government aid is, for the future, withheld from all sects, but the interests of all existing incumbents are protected. There are in the colony 396 registered clergymen of all denominations, 576 churches and chapels, 922 dwellings or public buildings which are used for public worship, and 588 Sunday-schools, which are attended by 35,500 children. There are 1069 ordinary schools throughout the country, at which 53,500 scholars receive instruction daily.

The colony numbers several gentlemen who are prominent in letters and science. The Rev. W. B. Clarke has a European reputation as a geologist; Dr. Bennett is well known as a naturalist; and Mr. J. Tebbutt, jun., has attained distinction in astronomy. Some of Mr. Henry Kendall's poems have been favourably noticed in England, Miss Ironside's paintings have been admired in Rome, and Miss Chambers has been regarded as a "*prima donna*" in Florence. Thus the country promises well in letters, science, and the fine arts.

A paper by Mr. Clarke, on the Geology of Australia—one by Mr. W. Keene, on the Coal-fields of New South Wales—one by Mr. Tebbutt, on the state of Astronomical Science in the colony—and one

by Dr. Bennett, on the cultivation of the Orange—are appended to this Report.

As the intellectual condition and tendencies of new countries form interesting objects of contemplation, the Executive Commissioner requested Mr. G. B. Barton—a gentleman known to devote much attention to literary pursuits—to favour him with a paper on the state of the Belles Lettres in New South Wales. Mr. Barton is a native of the colony, a Barrister of the Middle Temple, London, and Reader in the English Language in the University of Sydney. Although pressed for time, from the shortness of the notice he had received, Mr. Barton has produced a volume which must in time prove a valuable record. The work, it is alleged, is by no means as comprehensive as it might have been. Omissions were perhaps unavoidable under the circumstances. The writer of these pages, however, considers it due to Mr. Barton to say that, in his opinion, the work gives a fair general estimate of the literature of the colony.

But marked as the progress of New South Wales has been during the past portion of the present century, there is good reason to believe that it will henceforth be much greater. Steam communication and the electric telegraph are working their wonders in Australia as well as elsewhere. Were Colonel Collins to revisit this sphere, he would be surprised to find that the voyage to Sydney, which in his day "was happily concluded in eight months and one week," is now accomplished by steamers in from fifty to sixty days, and by sailing vessels in from eighty to one hundred. Telegraphic communications have been had from London in twenty-five days.

Sydney has now postal communication with Europe by three distinct routes, viz.:—1st, by the Peninsular and Oriental Company's steamers, direct by Galle and the Red Sea; 2nd, by Queensland, Torres Straits, and Singapore; and 3rd, by the Panama route—by New Zealand across the Pacific. The first of these is, as a postal line, decidedly the most successful. The second—through Torres Straits—was uniformly upheld by the late Admiral Philip Parker King as the best route, and his opinion upon this, as well as upon all questions connected with his profession, is held in the highest respect by his fellow-colonists; but he contemplated arrangements by light-houses on the various islands which would admit of vessels running through the Straits by night as well as by day. At present, from the number of coral reefs, vessels going through are obliged to anchor at night. The third—by Panama—is of very little, if of any, use to New South Wales as a postal line, but it brings the colony into direct communication with North and South America. The mails arrive by each of these routes once a month. Those by Queensland, Torres Straits, and Singapore, and by New Zealand and Panama, have been but recently established, and the colonists have as yet had little or no experience of their effects. It is impossible, however, but that they must derive many advantages from the intimate communication they thus have with all parts of the world; not only commercially, but in the social and intellectual intercourse which breaks down national prejudice, leads to a juster appreciation of national character, and to a higher sense of truth and right among mankind.

Although the Australian are perhaps the most purely British settlements that ever were founded, it is gratifying to the colonists to have

men of other nations enrolled among their most useful citizens. Among these, New South Wales has many from France, with whom her people are in most friendly intercourse.

In addition to the industrial products of the colony, the Local Commissioners endeavour to represent on this occasion some of the characteristic forms of Australian animal life. A request to this effect was made to His Excellency the Governor, by the imperial authorities. But the flora and fauna of Australia differ so much from those of other countries, that the Commissioners have thought it advisable that their exhibits of this nature should not be limited to existing species. They desire to represent Australian life not only as it is, but as it was in former geological periods; and with this view submit fossil specimens also, in illustration of any peculiarities which may have attached to it in past ages.

And the Local Commissioners have also thought that it would be interesting to exhibit man in his "stone age," as exemplified by the aborigines of Australia, in juxta-position with man in the golden age of his present civilization, as existing in the great capitals of the old world. In the rude products of aboriginal ingenuity which they have sent to the Exhibition may be contemplated the rudiments of those qualities and powers which in their higher development give man the position he now holds in the world. From the canoe of the savage may be traced the lines of the iron-clad: in the flint spear-head—in the stone knife or tomahawk—in the line, the net—the rudiments of those arts which have made man, even in his short individual existence, the lord of created life. And as in every age and stage of savagism, barbarism, or civilization, " suffering is the badge of all our tribe," so the poor savage too has to grieve, and the evidences of his mourning are not wanting in this collection of aboriginal memorials.

T. A. MURRAY,
Executive Commissioner.

Sydney, January 1st, 1867.

WOODS INDIGENOUS TO THE SOUTHERN DISTRICT,

WITH REMARKS DESCRIPTIVE OF THE NATURE OF THE TREES, AND THE QUALITIES OF THEIR WOODS, SO FAR AS THESE COULD BE ASCERTAINED.

"A SHORT description of the general features of the kinds of Woodland, from which have been collected the majority of the specimens of Woods hereinafter described in detail, with a few observations upon the general character of the latter, would seem to be a desirable introduction to the Catalogue. They will be useful in rendering the subject more intelligible to all who have not had the opportunity of informing themselves by personal observation. For greater convenience, the different descriptions of natural Woodlands will be included under three classes; and the letter denoting its Class will be inserted opposite to each specimen of Wood.

Class A.

"Forest more or less open; generally composed of trees with little or no underwood; their trunks more or less naked and lofty, height being a more conspicuous feature than diameter; their heads small in proportion to the trunks, divided into few secondary or tertiary ramifications, and thinly clothed with persistent, dry, dull-coloured, thick, leathery leaves, abounding in essential oils, and in their decomposition adding little to the vegetable matter in the soil. The different species, Eucalyptus and Angophora, with Melaleuca, Callistemon, Syncarpia, and Lophostemon, compose the larger trees which furnish all the common durable hard-wood timber used in Sydney and the adjoining districts. Occasionally these dry forests pass into tracts crowded with trees, generally of a single species (still with little or no underwood), their trunks being drawn up to a great height, and of small diameter. The trees of this class are usually produced to a greater size, and with better quality of timber, on lands rather poor than good; the more fertile lands commonly producing trees of comparatively small dimensions, thinly scattered over their surface. The rich alluvial lands on the margins of rivers are exceptions to this rule—they are almost always heavily timbered, and towards the coast their character passes from A to C.

"There are some characteristics applicable to the whole of the large trees of this class. When at full maturity they are rarely sound at heart, and even when they are so, the immediate heart-wood is of no value, on account of its extreme brittleness. In sawing up logs into scantlings or boards, the heart is always rejected. The direction in which the larger species split most freely is never from the bark to the heart (technically speaking, the 'bursting way'), but in concentric circles round the latter. Some few of the smaller species of forest trees are exceptions to this rule; such as the different species of Casuarina, Banksia, and other species belonging to the natural order Proteaceæ. The latter, however, with little exception, belong to class B. They split most freely the 'bursting way'; as do the Oaks, &c., of Europe and

America. A very serious defect prevails amongst a portion of the trees of this class, to such an extent as to demand especial notice here. It is termed 'gum vein,' and consists simply in the extravasation, in greater or less quantity, of the gum resin of the tree, in particular spots, amongst the fibres of woody tissue, and probably where some injury has been sustained; or, which is a much greater evil, in concentric circles between successive layers of the wood. The former is often merely a blemish, affecting the appearance rather than the utility of the timber; but the latter, when occurring frequently in the same section of the trunk, renders it comparatively worthless, excepting for fuel. In the latter case, as the wood dries, the layers with gum veins interposing separate from each other; and it is consequently impracticable to take from trees so affected a sound piece of timber, excepting of very small dimensions. The whole of the species of Angophora or Apple-tree, and many of the Eucalypti, or Gums, are subject to be thus affected; and it is the more to be regretted, because it appears to be the only reason why many of the trees so blemished should not be classed amongst the most useful of the hard-woods of the colony. Another characteristic among these hard-woods is deserving of notice: although the majority of them make excellent fuel, and are valuable on account of the comparative quantity of steam they are capable of generating, the greater part are slow to kindle, and a few of them will hardly burn at all. To this circumstance, probably, is to be attributed the small number of houses burnt—in a climate and amongst a population likely to afford an unusual proportion of such accidents. Few of the species of Eucalypti are rich in potash, but several of the genus Angophora contain it abundantly.

"It would be difficult to form even an approximate estimate of the number of species of Class A, producing good timber, throughout the settled districts of New South Wales. It is believed that very few of them have a wide range; the same local names being applied many times over to different species, in different districts.

Class B.

"Barren scrub, covered either wholly with low shrubby vegetation without trees, or with short-stemmed, stunted trees, rarely or never producing serviceable timber. The same dry character of vegetation prevails over this description of country as over the last. The 'bush fires' which sweep over these barren scrubs, once (at least) in every four or five years, effectually prevent the species which do not grow with naked trunks from obtaining the dimensions they might otherwise be susceptible of acquiring. At each burning the majority are killed to the ground, to be reproduced from the collar. Good specimens of their wood for illustration are, therefore, scarcely attainable. It may be observed that the majority of the beautiful flowering shrubs of the colony have their habitats in this sort of country, which is almost always more or less rocky, stony, or sandy.

Class C.

"Rich Brush or 'Cedar Brush.' Tracts of country rarely of great continuous breadth, but often alternating at short intervals with Class A,

and prevalent only at moderate distances from the sea, or, at all events, to the eastward of the great dividing range.

"This description of woodland often occupies country covered with rocks and stones, but of such geological character that a rich soil results from their decomposition. It usually follows the course of streams; and, in country favourable, geologically speaking, to the formation of good land, the Cedar Brushes fill up the valleys and the gorges of ravines with their dense vegetation. They are to be found in the greatest perfection at Illawarra, a few miles from the open sea-coast, upon natural terraces skirting the mountain side, at various elevations up to 1500 feet; and upon rich alluvial plains, particularly in the districts to the northward of Sydney, where they are described to be of great continuous extent. They produce few shrubs, but a variety of trees of considerable altitude; frequently of comparatively slender growth, almost universally clothed with beautiful, dense, bright green foliage; their umbrageous character being much increased by the numerous lofty ligneous climbers ('bush ropes') which attain their topmost branches, and frequently throw themselves from tree to tree. At Illawarra, and in some other districts, four species of arborescent ferns, and two noble species of palms, add materially to the tropical aspect of this description of country. A few of the trees of Class A are to be observed thinly scattered through the Cedar Brushes. In such case they often attain the most magnificent dimensions, but their general character remains unaltered.

"During the heats of summer, the atmosphere of the Cedar Brushes is always much less dry, and the temperature more equable than it is upon adjoining lands not clothed with rich vegetation. Bush fires rarely or never extend into their recesses, which are difficult to penetrate, even on foot, owing to the numerous irregularities of surface which prevail, and to the tangled nature of the vegetation. These difficulties apart, nothing can be imagined more charming to the beholder, especially where glades or natural openings occur to enable him to comprehend the full grandeur of the still life around him. The extreme loftiness of the noble trees, which are thrown together in surprising variety, with stems rarely cylindrical, but of the most picturesquely irregular forms,* covered with mosses and orchids, and loaded aloft with huge masses of epiphytical ferns of exquisite beauty. All these vegetable wonders,

* "Amongst the forms which attract the attention of a stranger, may be instanced the Giant Nettle *(Urtica gigas)*, a common brush-tree, which occasionally attains very noble proportions. Two specimens, growing near each other, upon measurement proved respectively to be 40 and 42 feet in circumference at 4 feet from the ground. The smaller one, still in full vigour, rises from its base by a series of buttresses of singularly regular outline, gradually tapering upwards without a branch to the height of 100 to 120 feet; the trunk then dividing into a regularly formed, wide-spreading head.

"But in picturesque beauty, as well as in stature, the nettle must give place to the Giant Figs. Of five species of this genus common to the brushes, three *(Ficus macrophylla)*, and two with very small leaves (the names of which we have not ascertained), become huge trees. The largest actually measured girthed about 86 or 87 feet—its very irregular form preventing any approach to accuracy. It would be difficult by description to convey an adequate idea of the grand yet wild character of these singular trees. Originating from seed deposited by birds, high up among the branches of the tallest trees, the plant

viewed in the transparent, green, and almost sunless light which even on the brightest days pervades their recesses, combined with the delicious fragrance, and the agreeable temperature which, in fine weather, invariably characterises the Cedar Brushes, astonish and gratify the lovers of sylvan scenery. But although the senses are charmed, the difficulties in exploring them, to ascertain of what species of trees they consist, are very great; and still more serious are the obstacles to be surmounted in getting out new trees when found. The common use of the wood of the Cedar *(Cedrela Australis)* in joiners' and cabinet-work, and its extensive exportation to the neighbouring colonies and to Europe, have induced the sawyers to penetrate into every nook from whence sawn timber could be dragged out. But in seeking out this particular tree, they would appear to have neglected all the rest. The most experienced amongst them have no names for a great number, and can give little information to be relied upon with regard to the qualities of their timber. They have been in the habit of confounding together numerous species, under the general designation of 'brush trees.' It requires careful and laborious investigation, on the part of a stranger in these brushes, to distinguish trees even of very different families. Their foliage is often so far overhead, and so intermingled with that of neighbouring trees and climbers, their trunks are so covered with epiphytes, and the light is so imperfect, that the tree often requires to be cut down to determine its identity. Even then, it frequently becomes further requisite to cut down several of the neighbouring trees, which have their branches attached to it by 'bush ropes,' before the tree will fall and bring the foliage within the explorer's reach. The uncertainty of their periods of flowering and fruiting gives rise to further difficulty. On the present occasion, although they have been repeatedly examined at short intervals over a period of six months, comprising the seasons at which they might be expected to show flowers or fruit, it is remarkable how few have been detected in a fertile state. These few forming the exception rather than the rule, with the particular species to which they belong, it would appear to be certain that the great majority of the trees of this class do not flower every year, and many of them only at long intervals. In proof of the intimate intermixture of many kinds of trees, it may be stated that, skirting a narrow track through a Cedar Brush for about half a mile, more than sixty species were observed, all growing within twenty or twenty-five yards of the track. Of these, above three-fourths were of the stature of trees. It may be remarked, also, that no two brushes resemble each other precisely. Fresh species of trees make their appearance in each succeeding brush, whilst others disappear. This

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commences its growth by extending its rope-like roots directly downwards. Getting firm possession of the soil, it then gradually embraces the parent stem, until the latter wholly disappears under the successive ligneous layers deposited by the Fig, and becomes the centre of an enormous fluted column, generally of very irregular form, but always supported by huge buttresses, which extend to a great circumference at the base. The Fig has now become the monarch of the surrounding brush; extending its immense cupola-shaped head high above the surrounding trees, and its roots far around, in ridges like low walls, several feet above the soil. An instance was observed, in which, supposing the tree to be standing alone upon a plain, a hundred men might be placed, sitting or lying down between the roots, perfectly concealed from view at a short distance.'

characteristic seems to prevail wherever an opportunity of examining them closely has been afforded.

"The timber of the trees of this class differs remarkably from Class A. The grain is much finer, it is also more generally sound at heart; and the heart-wood, if not shaken in the fall of the tree, may be used, as is the case with the timber trees of Europe. Even when of very large size, and not sound at the butt, they are often perfectly so a little higher up. They differ generally, also, from the trees of Class A, in splitting most freely the 'bursting way.'

"Although their qualities be so little known, it is not to be doubted that some of them would prove of great value. The very imperfect collection of them which has been made on this occasion affords evidence that some possess considerable beauty. At the same time, it should be observed that the timber of a considerable portion is not durable when exposed to the weather or to damp; and that as a class they are neither, for strength nor lasting qualities, to be compared with the numerous more coarsely grained but almost imperishable woods of Class A."

The foregoing extracts from the Catalogue of 1854 formed the introduction to the Catalogue of the Southern Woods collected for the Great Exhibition at Paris. They are reprinted because the description of the different classes of Woodland seems to be substantially correct, and to have answered its purpose. The total number of woods to be now exhibited falls short of the collection made in 1854; but in that collection several were repeated by error under different numbers, and there were about fifty other species, which have now been purposely omitted, on account of their inferior size or want of interest. In arranging this collection some attempt at classification has been made by bringing together into groups, in so far as our knowledge of them would permit, the woods of the same genera and natural orders; but this classification is necessarily imperfect, because there are a considerable number of whose affinities we are ignorant.

WOODS FROM THE NORTHERN DISTRICTS OF THE COLONY,

COLLECTED BY MR. CHARLES MOORE.

THE woods referred to in the following Catalogue were collected in the Clarence and Richmond Districts, and are principally from localities similar in every respect to that described as "Rich Brush," "Cedar Brush," in the introduction to the woods of the Southern Districts. It may be well to observe, by way of further information, that this description of country occupies both sides of the Clarence River for upwards of sixty miles, in belts of no great breadth. On the banks of the Richmond it is not extensive or so continuous; but from the north branch of that river a rich brush woodland extends in an inland direction to the north-west and south-west for nearly one hundred miles each way; skirting, more or less, the vast basin formed by the New England dividing range. The number of species of trees, and the size to which many of these attain in this magnificent country, especially on the table-land, is truly astonishing, some Red Cedars being ten feet in diameter, and yielding 30,000 feet of saleable timber. Yet so little is known of these woods, that beyond the Cedar *(Cedrela)*, Pine *(Auracaria)*, Rosewood *(Synoum)*, Ash *(Flindersia)*, Beech *(Vitex)*, Tulip-wood *(Owenia)*, and Silky Oak *(Grevillea)*, nearly all the others are regarded as worthless, excepting for firewood. Owing to the state of the country from floods, the want of time, and the impossibility of procuring adequate assistance in these somewhat remote districts, the kinds of wood selected for exhibition are, for the most part, small in size and limited in number. These, therefore, very imperfectly represent the timber resources of the North.

It is desirable to add, that the collection was made at a season when the sap was rapidly rising. From this cause, as well as from the subsequent exposure to the sun and air, to which they were all unavoidably subjected, many of the sections have split, or have been otherwise injured. By comparing this with the preceding catalogue, it will be observed that while some trees are common to both districts, such as the large-leaved Fig *(Ficus macrophylla)*, large Nettle *(Urtica gigas)*, Native Tamarind *(Cupania Australis)*, and the Red Cedar *(Cedrela Australis)*, and some others, that in general there is a great distinction in genera and species between the trees of the South and those of the North. The most remarkable difference in this respect is the entire absence in the former of Araucaria, Flindersia, Castanospermum, Rottlera, Argyrodendron, and Owenia—genera which abound everywhere in the latter, and mark by their peculiar appearance the localities in which they grow.

Botanical Gardens, Sydney, 10th October, 1866.

ON THE INTRODUCTION AND CULTIVATION OF THE ORANGE IN NEW SOUTH WALES.

BY GEO. BENNETT, M.D., F.L.S.

Those persons, whether visitors or residents, who may feel any interest in the naturalisation of choice fruit-trees in New South Wales, should visit the extensive gardens of orange and other fruit-trees near Parramatta, and in other districts of the colony. Oranges, lemons, apple, pear, loquat, apricot, peach, and other excellent fruits, together with extensive vineyards stocked with superior kinds of grapes, may be seen growing in the greatest luxuriance.

When the question is asked, what is the use of acclimatisation? the appearance of the gardens just mentioned, filled with healthy trees in full bearing, will be the best reply. At the same time, we must recollect that this result was not obtained without labour and difficulty, and the study of the most suitable soils and situations, when, all impediments having been overcome by judgment and perseverance, the experiments terminated in success, the trees became naturalised, were readily propagated, and after many years the result has been a source of great wealth to the colony, the produce finding a ready market, both for exportation as well as home consumption.

My attention was directed to this subject by a visit made on Saturday, December 8th, 1866, to the extensive and fertile orangery of Mr. James Pye, near Parramatta, in company with Mr. Charles Moore and Dr. Fyffe. It is situated on a point of land known as the "Governor Arms," on the south side of a creek running from Castle Hill into the head of the Parramatta River. The orangery is planted on land more or less elevated, near a creek, the fruit-trees growing on the slopes as well as on level ground. I observed that the orange, lemon, and apple-trees of various kinds (of which the greatest number of trees consisted) were in a very healthy state, and growing with the greatest luxuriance, *in a very poor sandy loam, from which large sandstone rocks cropped out over the whole of the land*, the trees being planted around and between them. The situation was sheltered, and the whole extent of the fruit-gardens was 12 acres, divided into three paddocks or enclosures; and the neatness and order of the ground, and the perfection of the trees in growth and bearing, excited our admiration. I remarked in the Azores or Western Islands that the soil is volcanic, and generally a friable loam, and many of the orange-gardens are formed in places where there is often not a greater depth of soil than 18 to 20 inches above the shattered mass of rubble and rock which has been thrown together by volcanic action. The orange trees at Mr. Pye's were still bearing ripe fruit; and a quantity of a second crop, as yet but small and unripe, were on many of the trees—for there are often three crops of oranges during the year, the fruit of each crop differing in form and size, but all of excellent flavour. I remarked that the oranges are of a dark-reddish orange colour, of a deeper hue than I had usually seen them. Whether this was occasioned by the advanced state of the season, or other causes, I could not determine.

A quantity of oranges from the garden were lying in heaps in the out-house, ready for packing, as well as a number of well-filled boxes, prepared for transmission to Sydney. A large quantity of oranges are exported to Tasmania, Melbourne, and other of the southern ports of Australia, and also to New Zealand. There is a dark-skinned orange often seen on the trees, which colour is occasioned by a kind of fungus being deposited on the rind. It is called the "Black" or "Maori" orange, by the growers. At first sight, the dark colour occasions it to be rejected as unsound; but when tasted it is found to be of as luscious flavour as any of the oranges of the normal colour on the tree, and are excellent for keeping. In this garden there were a few very young orange trees, easily distinguished at a short distance by their stiff, clumpy form. Most of the trees had attained a height when the full beauty of their rich green foliage had been developed, and were laden with drooping clusters of golden fruit, some of the clusters consisting of from sixteen to twenty oranges. The *Herald* of June 10, 1865, mentions that a bunch of oranges grown by Mr. Holroyd was exhibited, containing forty-two oranges on a single stem the thickness of a finger, and was grown on a yearly-worked tree, planted out in September, 1860. The fruit was very fine, and formed only a small portion of the produce of the tree from which it was taken. Some of the oranges, Mr. Pye informed us, had remained fifteen months on the tree, and when gathered were found to be sound, juicy, and sweet. On tasting some of them the result confirmed this opinion. The apple-trees, growing intermingled with the orange and lemon-trees in this inferior soil, consisted of russet, winter pearmain, quarrenden, red-streak, and other excellent varieties. They were all healthy, and in full bearing, but the fruit was not yet ripe. It was certainly more than might have been expected to see the apple and orange flourishing side by side. The Lisbon lemon-trees were bending under the weight of fruit of large size. Among some we gathered we weighed three. The first weighed 19 ounces; the second, 17½ ounces; and the third, 14 ounces. When cut, they were firm, very juicy, and in excellent condition. The varieties of the orange in the garden were the navel, mandarin, common, and a few Seville oranges, citrons, and limes. Although the whole of the excellent fruit-trees before mentioned grew with the greatest luxuriance in this poor soil, yet I was informed that peach, nectarine, and other stone-fruit would seldom last longer than three years after having commenced bearing. Many of the orange-trees were from twenty to twenty-five feet in height, and the wide-spreading branches and dense foliage afforded a cool and agreeable shelter from the heat of the sun. These trees were twenty years old. The trunk of one of them we measured was four feet one inch in circumference one foot from the ground, and three feet ten inches at four feet from the ground. Near them were some seedlings of large growth, nine years old, the fruit of which had not yet been gathered. Seedling trees are considered by orange-growers in Europe to be far less liable to be attacked by insects than those raised by layers. The trees, Mr. Pye informed us, were occasionally refreshed by fresh soil, to replace that which had been washed away by heavy rains; and at certain intervals of time, bone-dust was applied as a manure. From the situation of the gardens the roots of the orange and other fruit-trees appeared to be well-drained; for, from the locality, and the nature of the soil, it was not

likely that water would accumulate at the roots, which often causes the destruction of the orange-trees, more especially when the soil is clay, and the drainage is not attended to.

On arriving at another part of the orangery the magnificent orange-trees, celebrated for their size, and one of the objects of our visit, were now before us in all their beauty of fresh luxuriant foliage, and profuse bearers of luscious fruit. The previous accounts I had received of them were not over-rated, but it is only by actual inspection and attentive examination that a correct idea of them can be formed. It is seldom that in orange-growing countries trees are seen of this magnitude. One has been mentioned growing at St. Michael's (Azores) which, when measured, was found to be thirty feet in height, and the stem seven feet in circumference at the base. The photograph of these beautiful trees, taken by Degotardi, for the Paris Exhibition, although executed with great accuracy, does not represent the graceful drooping of the dense foliage, the delicate tints of colour—from a dark to the lightest hue of green—the light and shade of the leaves being contrasted by the rich colour of the ripe and ripening fruit; this is all lost in a photograph. The elegant appearance of these beautiful vegetable productions can only be truly and accurately obtained by a drawing in water-colours, and if executed by an artist accustomed to sketch from nature, would, no doubt, succeed in delineating their natural beauties. The lofty sandstone rocks on the opposite side of the creek, forming a background, would afford a good relief to the picture. This rocky portion of the landscape comes out very well in the photograph. These noble trees are now forty years old, and, although of full growth and mature age, were covered with a bright and luxuriant foliage, the bark smooth and healthy, young and slender stems branching in all directions, indicative of a vigorous and robust state of health, and bearing large crops of fruit every year. An agreeable shade was obtained under the extensive branches, where several persons could find a cool and agreeable resort from the heat of the sun. The loftier of the two trees was thirty-five feet in height; and the other was thirty feet high, but surpassed the former in the circumference of its branches, which, by actual measurement, was thirty-three feet in diameter from the extremities of the branches, making a circumference of ninety-nine feet. The first tree bifurcates a few feet from the ground; and, below the bifurcation, at a foot from the ground, the trunk measured five feet in circumference. The circumference of the lower portion of the bifurcated stems was—the first, three feet three inches; and the other, two feet ten inches. The fresh, vivid green of the foliage, and general healthy appearance of these, as well as all the orange and other fruit-trees in these extensive grounds, could not but excite our admiration. It has been stated that, in 1859, Mr. J. Pye gathered from two large trees in his orangery 2000 dozen (24,000) oranges. The gardens are situated on the banks of the creek, at an elevation varying from twenty-five to thirty feet. Pomegranate, loquat, quince, and other fruit-trees were planted in the gardens; but orange, lemon, and apple-trees of luxurious growth formed the largest proportion of fruit-trees, and was a sight rarely if ever seen in any other climate in the world.

In August last I visited the orangery of Mr. A. T. Holroyd, at Sherwood Scrubs, near Parramatta. It was a very young orchard,

compared with that of Mr. Pye, but it was in an excellent and flourishing state. The orangery consists of 13 acres, on which there are 850 trees planted, having seventy trees to the acre. Ten of the trees, he informed me, yielded this year upwards of 550 dozen of oranges. He obtains for his oranges this season 7d. to 8d. a dozen wholesale; and I understood that 2d. a dozen would pay the expenses of cultivation—all above that amount is profit to the grower.

There appears to me to be a great desire on the part of the orange-growers in this colony to import the St. Michael's orange, regarding it as a variety of very superior quality. On ordering plants of it from Europe, many have supposed they had obtained it, but were not satisfied with the result; for, on coming into bearing, the trees did not produce the expected thin-skinned variety, free from seed. The disappointment arises, in my opinion, from this cause:—From observations made at the Azores or Western Islands, I do not consider, except as a variety, it differs from the common orange generally cultivated in the colony; the improvement in the quality of the fruit, constituting a variety, resulting from the genial climate, soil, or careful cultivation. There are some trees at the Azores which are very old, and these bore the thin-skinned orange, very juicy, and free from pips. The thinness of the rind and freedom from seeds will be found to depend on the age and careful cultivation of the tree. The younger trees in all the gardens I examined, and the fruit (which was at the same time in process of packing for England), were for the most part similar in quality to the common orange produced in New South Wales (which was originally introduced from the Brazils, in 1788, and is no doubt the Lisbon orange, brought from Portugal to that part of South America), and generally with abundance of seeds. At the Azores the orange-trees are planted at a distance of from 25 to 30 feet apart, and the ground sown with lupins, which are considered by the Portuguese to be a favourite food of the orange-trees. Seven years elapse from the time of planting before the orange-trees come into full bearing, during which space of time, more especially among the poorer class of proprietors, the garden is sown with melons, water-melons, and other vegetables. The orange-trees are pruned every year, so that by thinning out their superfluous branches a free circulation of air is allowed, which is required for the proper ripening of the fruit. The orange-grounds at the Azores vary in size from 1 to 60 acres, and they are rarely occupied only by orange-trees; for, besides the vegetables before mentioned, among the more opulent owners, limes, citrons, sweet lemons, guavas, loquats, and other trees are scattered about. A recent writer (Mr. P. Wallace) observes that "there are two kinds of oranges cultivated in the island of St. Michael's (Azores)—namely, the Portugal and the Mandarin. Many varieties of the former exist, and they are greatly improved by the genial climate of St. Michael's. The mandarin orange has not been many years in the island, nevertheless there are some trees of it 14 feet high. This capital little orange has lately been exported to England, where it realises a higer price than the common St. Michael's."

Mr. George Oakes has also been very successful in the cultivation of the orange near Parramatta, and well bears out what the soil and climate are capable of producing. Some navel oranges, taken from trees that will be five years old next spring, and were grafted on seedlings, were exhibited very recently in the Sydney Market, and were found to weigh,

respectively, 22, 22¾, and 25½ ozs. Two common oranges on a single stalk weighed, together, 32 ozs. Some large specimens of the Emperor Mandarin orange, exhibited at the same time, also confirmed the excellence of the cultivation. Wax models of oranges, lemons, and other fruits, have been sent from the colony, to be displayed in the Paris Exhibition of 1867.

ON THE PROGRESS AND PRESENT STATE OF ASTRONOMICAL SCIENCE IN NEW SOUTH WALES.

BY JOHN TEBBUTT, JUN., WINDSOR, N.S.W.

New South Wales can hardly be expected to have contributed much hitherto to the advancement of Astronomy. Seventy-eight years only have elapsed since Sydney, its metropolis, formed part of its primeval forest, in which the aboriginal roamed in all his native freedom. In that brief period its progress in commercial prosperity has been rapid and astonishing, and the time is now probably at hand when it will take its place creditably among the old countries of Europe as a contributor to the arts and sciences. Now that we are possessed of an excellent University, opportunities are afforded to young men for the necessary training in order to distinction in scientific pursuits. And in so far as the science of Astronomy is concerned, the colony can now boast of a National Observatory, comparing favourably with many of those on the continent of Europe. The object of the present paper is to show, in as brief a compass as possible, that New South Wales is not without her associations in connection with astronomical science, and has in some measure contributed to its advancement. Her astronomical history commences with the establishment, in 1822, of the Parramatta Observatory—an institution founded and liberally supported by the private munificence of Sir Thomas M. Brisbane, who was Governor of the colony at the time. He was one of the vice-presidents of the Astronomical Society of London, and was distinguished for his ardent love of Astronomy, with the theory and practice of which he was familiar. Its cultivation was always a matter of interest to him, even in the midst of the turmoil and adventure of a military life. But it was not till his appointment as Governor of this colony that he had an opportunity for contributing in any marked degree to the advancement of his favourite science. He at once perceived the ample opportunities which an Observatory in the clear southern skies of Australia would have for extending our knowledge of the heavens. The labours of Lacaille at the Cape of Good Hope are well known to astronomers, and formed hitherto the chief contribution to our knowledge of the southern heavens. Under these circumstances the Observatory of Parramatta, in conjunction with that at the Cape of Good Hope, whose establishment was nearly contemporaneous with it, would have a wide and brilliant field for the development of its efforts. We shall presently see that the former is not without interest in the records of astronomical science. Sir Thomas Brisbane arrived in the colony in the year 1821. He brought with him two assistants for the work of the proposed Observatory, namely, Mr. Carl M. Rümker, a German, afterwards the distinguished Director of the Hamburgh Observatory, and Mr. James Dunlop, a gentleman of considerable natural talent as a mechanic and astronomer. The Observatory being completed, the work of observation was carried on with great assiduity. The principal instruments employed were a transit instrument of 64 inches focal length and $3\frac{3}{4}$ inches aperture, a two-feet mural circle, both by Troughton, a 16-inch repeating circle by Reichenbach, and a small equatorial of 42 inches focal length. The two first-named instruments were fully employed in forming a catalogue of southern stars; and in this work Sir Thomas himself, in

his relaxation from his governmental duties, took a large share. The first-fruits of the labours of the Observatory consisted in observations of the summer solstice of 1821, the results of which were made known to the astronomical world through the *Astronomische Nachrichten* of Schumacher. Determinations of both the solstices of 1822 were also appeared in that journal; and those of the solstices of 1823 were communicated to the Astronomical Society, together with an extensive series of observations of the principal stars in both hemispheres. The observations underwent a careful reduction in the hands of Dr. Brinkley, "the details of which," says Sir John F. W. Herschel, in an address delivered by him before the Astronomical Society, in February, 1828, on the occasion of the presentation of the Society's honorary medals to Sir T. Brisbane and Mr. Dunlop, "as well as the original observations, are printed in the first part of the second volume of the Transactions of this Society; and which justify, in the eyes of that experienced observer, as they must in those of every practical astronomer, a decided opinion of the great care and skill with which they have been made." Of occasional observations, a great number were furnished by the Observatory; among these may be mentioned observations of the planets Venus and Uranus near their conjunctions and oppositions, of comets, and of eclipses and occultations. One of the most interesting circumstances in the history of the Parramatta Observatory is the fact, that we owe to it the verification of one of the most remarkable investigations in physical Astronomy. I refer to the elaborate investigation by the late Professor Encké into the movements of the comet discovered by Pons in 1818, but which now universally bears the name of the distinguished professor. The comet had been seen on several occasions previously. Although the parabolic elements calculated for it at the different apparitions were identical, and showed, beyond doubt, that they belonged to one and the same body, yet no attempt had been made previously to 1819 to determine the period in which its revolution was performed round the sun. The investigation of this element, which was a work of profound difficulty in the then comparatively unadvanced state of physical Astronomy, was ably conducted by Encké. From the series of observations made during its visibility from the earth in 1818-19, he arrived at the conclusion that the comet was moving in an ellipse, with a period of about 3⅓ years. This announcement marked the first discovery of a comet of short period (there being only one comet of known periodic character hitherto discovered, namely, Halley's) and formed a very important epoch in the history of physical Astronomy. Encké proceeded to investigate the perturbations which the comet would undergo during its next revolution round the sun, from the combined influence of the planets, and fixed May 24th, 1822, as the time of its next perihelion passage. An ephemeris was computed from the resulting elements, showing the apparent track which the comet would pursue among the stars. Encké had the greatest confidence in the results of his investigations; but unfortunately for the gratification of the ardent expectation which every astronomer shared with him, it was found that the comet would traverse the southern hemisphere below the horizon of the European Observatories. It is necessary thus to enter briefly into the early history of this comet, in order to show the interest which the Parramatta Observatory had in the matter. It was now that the means for the verification of this important investigation was quite out of reach of European Astronomers, that the establishment at

Parramatta stepped in and supplied the want. On the evening of the 2nd June, 1822, the wanderer was detected by Mr. Rümker. A series of observations, extending to 29th June, was made, which enabled Encké to correct his elements, and predict the next apparition with increased accuracy. The only observations obtained were those made at Parramatta. The investigation was indeed a triumph, and no small merit is due to our Observatory for the part it performed in its verification. Observations of the length of the pendulum were also made at Parramatta, and published in the Transactions of the Royal Society for 1823. "The remainder, and, indeed, the great mass of the observations made with the mural circle and the transit instrument," says Sir J. Herschel, in the address before referred to, "have at different periods been communicated to the Royal Society, and are for the present deposited in its archives. Forming our judgment only upon those of which an account has been publicly read at the meetings of that illustrious body, but which are understood to constitute only a comparatively small part of the whole, they form one of the most interesting and important series which has ever been made, and must ever be regarded as marking a decided era in the history of southern Astronomy."

Besides the useful catalogue of 7385 stars which has already been published, as the result of the labours of the Parramatta Observatory, we have also Mr. Dunlop's catalogue of upwards of 600 southern nebulæ and clusters of stars, together with a large and valuable collection of double stars. Independently of the detection and observation of Encké's comet. the Observatory has not been behindhand in cometary discovery. On the 15th July, 1824, the first comet of the year was discovered by Mr. Rümker. It was seen only in the southern hemisphere, and I believe the only elements which have been computed for it are those by its discoverer. The comet of 1833 was detected by Mr. Dunlop on the 1st October, and observed to the 16th. No other observations are recorded. The comet which appeared in the following year, and was first discovered by Gambart, at Marseilles, on the 8th March, was also found independently by Mr. Dunlop, at Parramatta. The Observatory continued in operation till 1847, when it was dismantled; and it was not till ten years afterwards that anything worth recording was done in the colony in connection with Astronomy. For this period the colony remained without an Observatory, till Sir William Denison (another colonial Governor of considerable scientific attainments) drew attention to the importance of establishing in the colony an Observatory, supported wholly by the Government. A memorandum was addressed by His Excellency to the Executive Council, in March, 1855, on the subject. The Council concurred in the views of His Excellency, and the matter was immediately brought before the Legislature. A liberal sum was voted for the erection of a National Observatory, and the Rev. W. Scott, M.A., of Sidney Sussex College, Cambridge, on the recommendation of the Astronomer Royal of England, was appointed to the important office of first Astronomer to the establishment. He graduated as Third Wrangler in 1848, had continued to reside in Cambridge as Fellow, and afterwards Mathematical Lecturer of his college. Mr. Scott arrived in Sydney on the 1st November, 1856, and proceeded with as little delay as possible to select a site for the proposed Observatory. For purely scientific purposes, some site in the country would have been preferable for the building; but it was requisite that it should be within easy access of the public institutions of the metropolis.

The hill occupied by Fort Phillip was selected for the purpose, as it commanded the best view of the horizon and of the shipping in the harbour, for whose interests it was proposed to erect a timeball. In June, 1858, the building was so far advanced as to admit of meridian observations. The instruments at the disposal of the institution were those formerly employed at the Parramatta Observatory. The principal ones were the transit instrument and mural circle, a meridian circle, and a portable equatorial. In the absence of the meridian circle, which had been sent to England for repairs, observations were carried on with the transit instrument, simply for the determination of local time, and of the longitude by the moon and moon-culminating stars. Contemporaneously with the establishment of the Observatory, meteorological stations were formed throughout the colony. About this period occurred several astronomical phenomena of great public interest, which drew the attention of the colonists generally to the claims of astronomical science, and, as a consequence, to the high value of the newly-formed Observatory. Among these were the total solar eclipse of March 26th, 1857, and the appearance of the comet of Donati, in October, 1858. Calculations of the former phenomenon were published in the *Sydney Morning Herald* several days previously to its occurrence, by the Government Astronomer, Mr. F. Napier, and the writer of this paper. Unfortunately, however, no part of the total phase was seen at any station where instruments were available for its observation. Nothing could be recorded beyond a few meteorological and terrestrial observations. The Sydney Observatory not being yet completed, the Astronomer had prepared a temporary Observatory at the South Head of Sydney Harbour, in which a portable equatorial lent to him by the Governor formed the principal instrument. In the meteorological department he was assisted by Captain Ward, R.E. The sun was seen for about fourteen minutes after its appearance above the horizon during the progress of the partial eclipse. In addition to the meteorological observations at South Head, there was a series made at St. Leonard's, in its vicinity, by the Rev. W. B. Clarke, which were published in the *Herald* of April 9, 1857. The grand comet of Donati was an object of intense interest to the colonists. It was for some time supposed to be the illustrious body which appeared in 1264 and 1556, and whose re-appearance was expected about this time. Our national Observatory, then in its infancy, and in an incomplete state, could not furnish any accurate information respecting the interesting stranger. Approximations to the orbit were severally computed from sextant observations by the Government Astronomer, Mr. Hawkins, of the King's School, Parramatta, and the writer, which showed the comet to be quite a different body from the expected great comet. Its appearance showed the absolute necessity of furnishing the Observatory with an instrument of a high class for extra-meridian observation. The Astronomer accordingly submitted a report on this subject to the Government, and the Legislature, with their accustomed praiseworthy liberality, granted the sum of £800 for the purchase of a large equatorial instrument. At the close of 1858 the transit circle was received from England, and was mounted with all possible despatch. Regular observations were commenced with it in June, 1859. These consist of determinations of the right ascension of the moon for longitude, and of the positions of stars culminating near the zenith of Sydney. The latter results will hereafter be found useful for

the determination of the latitude of other points in the colony. Four volumes of transit and zenith distance observations of stars have been published, embracing the period from the middle of 1859 to the middle of 1862. The transit circle is described as only a second-class instrument; but, considering the care and skill employed in the use of it, the volumes referred to will be found to be a very valuable contribution to the science. In the cometary department of Astronomy the colony was wholly indebted for its information to the labours of the Government Astronomer, Mr. Hawkins, and the writer. The attention of the colonists was again strongly drawn to the claims of astronomical science by the appearance, in 1861, of one of the most splendid comets of modern times. The newspapers of the day teemed with correspondence respecting the stranger, and the predictions of its movements created much excitement. It was detected by the writer on the evening of the 13th May, and its position determined, with great difficulty, by means of a small telescope and a sextant. The discovery was communicated to the Sydney Observatory as soon as he was convinced of its cometary character, and a letter announcing it appeared in the *Herald* of 25th May. Mr. Scott's first observation of the interesting stranger was obtained on the evening of the 22nd, with the old Parramatta equatorial—the only instrument immediately at his disposal. A new equatorial, by Merz and Son, of Munich, had just arrived, of 10 feet 4 inches focal length and 7¼ inches clear aperture, but was not yet mounted. Observations were continued with the old equatorial, and it was not till 9th June that the first observation was obtained with the new instrument. On the 15th June the writer published his first determination of the orbit in the following communication to the *Sydney Morning Herald*:—

THE COMET'S ORBIT.—Sir—The following is a rough approximation to the orbit of the comet now visible. It is based on the observation made at the Sydney Observatory on the 24th May, and sextant observations made here on the mornings of the 3rd and 11th June:—

Perihelion passage, June 13, d. 7253, 1861.	Greenwich mean time.
Perihelion distance	0·82033
Longitude of ascending node	280° 0′ 44″
Longitude of perihelion on the orbit	252° 13′ 30″
Inclination of orbit	86° 18′ 42″
Heliocentric motion	Direct.

The above results will doubtless hereafter require considerable correction, as it is difficult to obtain an approximate orbit from a few observations made at the commencement of a comet's visibility. This fact was exemplified in the case of Donati's comet, the earlier orbits computed for it being afterwards found to be very incorrect. I have some doubts as to the direction of the present comet's heliocentric motion, as in the case of an almost perpendicular orbit small errors in the adopted positions of the comet might produce an error of several degrees in the inclination, and thus convert a retrograde into a direct motion. The true numbers will be approximated to as observations accumulate. My calculations show that the comet will soon move rapidly towards the north, and that on the 29th inst. the earth will be at no great distance from the extremity of its tail. There is some probability of the comet becoming visible in full daylight about that date.

Windsor, June 13.

This was supplemented by the following more particular statement in the *Empire* of June 22nd:—

The following particulars, deduced from the rough orbit I have already computed, will perhaps not be uninteresting to your readers. On the night of

discovery, the comet was distant about 124 millions of miles from the earth, and 96 millions from the sun. It arrived at the perihelion point of its orbit on the 13th inst., its distance from the sun at that time being 78 millions of miles. Although the comet is now increasing its distance from the sun, its distance from the earth is diminishing at the rate of about 2¼ millions of miles daily. This diminution will go on till about the time of the comet's passing its ascending node—namely, on the 29th inst., when the distance of the nucleus from the earth will be about 14 millions of miles. Its distance from us at this date is 35 millions of miles. On the last two or three mornings I have observed the tail to be divided into two branches, which emanate from the main part of the tail, at a distance of about six degrees from the head. The upper or western branch was the more distinct, and I could trace it to a distance of 42 degrees from the head. The tail, supposing it to point directly from the sun, will cross the earth's path about the 29th inst., at a point which will be occupied by the earth on the 2nd July; so that it appears the earth will have a narrow escape from being enveloped in the more diffused part of that appendage. The comet will be in conjunction with the sun about the beginning of next month, and will shortly afterwards become visible in the evenings in the north-west.

The remarkable announcement of the near approach of the comet's tail to the earth was received with confidence by some, but with extreme distrust and even ridicule by others; and it was not till determinations of the orbit were published respectively by the Government Astronomer and Mr. Hawkins that the public mind was assured of the correctness of the prediction. On the evening of the 30th June this wonderful body made its appearance above the European horizon, and employed the efforts of the most distinguished observatories. A few days after its sudden appearance in England, Mr. Hind made the following announcement in the newspapers, which was received with the highest interest:—

It appears not only possible, but even probable, that in the course of June 30 the earth passed through the tail, at a distance of perhaps two-thirds of its length from the nucleus. I think the earth would very probably encounter the tail in the early part of that day; or, at any rate, it was certainly in a region which had been swept over by the cometary matter shortly before.

It does not appear to be known in Europe that this remarkable circumstance of the comet's movements was *predicted* in New South Wales. In the Rev. W. Webb's account of the physical appearance of this comet, he noticed the gradual closing up of the branches of the tail on the evening immediately succeeding the earth's passage through that appendage. The opposite of this perspective effect was remarked by the writer on the mornings immediately preceding the event. The observations of the comet are numerous, and extend over a considerable period. Those made at the Sydney Observatory were published by the Royal Astronomical Society, together with an accurate set of parabolic elements, by Mr. Hawkins, of Goulburn. The observations were also published by Professor Peters, the distinguished Director of the Altona Observatory, in the *Astronomische Nachrichten.* Sextant observations made at the Williamstown Observatory, Victoria, extending from the 6th to 19th June, also appeared in the same journal. A careful series of sextant observations was also made by the writer, but has not yet been published. In the year 1861 the Government Obervatory may be said to have been complete in every respect. The total number of meridian observations made and reduced during the year 1860 was 2820, of which 2507 were published. The number made in 1861 was 2100, being fewer than in 1860, owing to the efforts of the Astronomer

and his assistant being partly devoted to the employment of the new equatorial. Occultations of fixed stars, approximately computed by the writer for the purpose, were observed with this instrument, and also a few of Sir J. Herschel's double stars. The comet observations made at the Observatory during Mr. Scott's superintendence consist of those of Comet III., 1860, Comet II., 1861, and Encké's Comet, in the beginning of 1862, all of which have been communicated to the astronomical institutions of Europe. Mr. Scott contributed several useful papers to the Colonial Philosophical Society, and in his official capacity he endeavoured to form a class of amateur astronomers. It is, however, much to be regretted that this attempt did not meet with the support it deserved. After ably fulfilling the duties of his post, from the establishment of the Observatory till the close of 1862, he resigned his appointment. The Observatory remained in charge of the assistant, Mr. Russell, till the beginning of 1864, when Mr. George R. Smalley, B.A., formerly Assistant at the Observatory of the Cape of Good Hope, was appointed to the office. During the interval, the chief work performed was the transit observations for local time, and the reduction of the meteorological observations made at the Observatory and the country stations connected with it. I am not aware that any observations have been published since 1862, of a purely astronomical character. A careful series of observations of Mars at its opposition in 1862 was, I believe, made by Mr. Russell during the time he was in charge of the establishment. The time has scarcely yet arrived for the establishment in the colony of private observatories on a large scale. The history of Astronomy in New South Wales rests almost entirely on the labours of the Parramatta and Sydney establishments. Occasional observations have proceeded from the private Observatory of the writer, at Windsor. The first fruits of this small establishment, which have been published in Europe, were the observations of Comet II., 1862, communicated in a paper read before the Royal Astronomical Society, at their monthly meeting held January 9, 1863, together with the elements deduced therefrom. Since the resignation of the Government Astronomer, all the local information respecting the different comets which have appeared in the colony has been derived solely from the Observatory at Windsor. The principal instruments are—a transit instrument mounted on a substantial pier, and an excellent refracting telescope by Jones, of 3¼ inches aperture and 48 inches focal length, equatorially mounted under a revolving roof. The writer hopes shortly to be in possession of a good transit circle, which will aid materially in the character of the work. Meteorological observations of the same class as those at the Sydney Observatory are conducted with accuracy and regularity, and will be published in due course. These observations, after complete reduction, were forwarded monthly to the Sydney Observatory, during the years 1863, 1864, and 1865, to be incorporated with the returns from the Government stations. Transit observations of the moon, and moon-culminating stars, are taken for the determination of the longitude from Greenwich. The longitude with reference to the Sydney Observatory has been accurately determined by telegraphic time signals. The accurate determination of the latitude has not yet been made. Occultations of stars by the moon, eclipses, &c., of Jupiter's satellites, and other occasional phenomena, form part of the work of

the Observatory. The comet observations already made have appeared in the *Notices* of the Royal Astronomical Society, and the *Astronomische Nachrichten.* Comet II., 1864, was well observed in Europe during the earlier part of its apparition, but the latest published observations depend on the Observatories at Athens, Santiago, and Windsor. It was found at Santiago, in South America, and at Sydney and Windsor, in the beginning of August, and followed till its disappearance at the close of September. The observations at Santiago and Windsor appeared in due course in the *Astronomische Nachrichten*, and were turned to account in a careful investigation of the orbit by Dr. Kowalczyk, of Warsaw, the results of which appeared in that journal for September 2, 1865. It is highly gratifying to find, that out of 191 determinations of position, at seventeen different Observatories, twenty-five were made at Windsor; and that of 144 employed in the formation of the normal places for the final correction of the orbit, ten are from the same place. The fine southern comet of last year was also carefully observed in the colony, and also at Santiago and Melbourne. It was for some time thought to be the grand comet of 1843, which Sir J. Herschel conjectured might appear about the beginning of 1865. Another interesting event in connection with the writer's small establishment is the discovery of Encké's comet at its last apparition. The circumstances of its apparent track in the heavens were very similar to those attending it when it was detected by Rümker, at Parramatta, in 1822, it being altogether out of reach of the European observatories. The usual ephemeris was awaited with impatience. Towards the close of June, 1865, the writer felt assured the comet must be in a part of the sky visible to New South Wales astronomers and within reach of a moderately-sized telescope. Its rough positions were accordingly computed, on the assumption that it passed its perihelion on the 1st June, and was moving in the orbit assigned to it by Encké in 1862. A few minutes' search, on the evening of the 24th June, revealed the interesting wanderer as a very faint nebulous object, without any indication of a nucleus or a tail. If there could be any doubt as to the identity of the comet with that of Encké, it was wholly removed by an approximate ephemeris received from the Nautical Almanac Office, by the mail on the 30th June. The observations on the evening of the 24th showed the comet to be forty-two seconds of time east, and thirty-seven minutes of arc north of the position assigned to it in the ephemeris. The discovery was at once communicated to the Sydney Observatory, and some observations were obtained of it with the large equatorial. The comet was found again after the full moon, with the aid of the ephemeris, but it was so excessively faint that the observations are but mere guesses. The results of the Windsor observations on the 24th and 29th June were forwarded to the *Astronomische Nachrichten*, and are the only ones published in that journal up to March 14, 1866—the latest date received.* A vigorous search was made for Biela's comet at the beginning of the present year, in accordance with the ephemeris published by Michez, but without success. Indeed, it appears from the latest dates of the *Astronomische Nachrichten*, that two

* I have since found that the comet was imperfectly observed by Bruhns and Engelmann, at Leipsic, on the evening of the 13th February, 1865, or long previously to its arrival in perihelion.

of the best European observers had given up all hopes of finding it. It is hoped that this interesting member of the comet family has not altogether vanished from the heavens.

The work of the Government Observatory still goes on, under the direction of Mr. Smalley. His first annual report of the state and progress of the institution has been published. The number of meridian observations during the year 1864 was only 644, the work of the Observatory having been much retarded by a course of repairs to the building, and the unusually rainy season. A series of observations of Comet II., 1864, was made, embracing the period from August 15th to September 20th. The meteorological work had been carried on as usual. A new feature in the labours of the Astronomer, and one of the highest scientific importance, consists in observations at different points of the colony, preliminary to an accurate magnetic survey. The observations were made at twelve different stations. The work proposed for the future embraces a considerable variety. Meridian observations of Nautical Almanac stars were to be continued; observations for the re-determination of the longitude and latitude of the Observatory were to be made as often as possible; the stars compared with the comet of 1864 were to be re-observed on the meridian; the absolute determination of the magnetic elements to be carried on monthly; and the re-observation of Sir John Herschel's double stars with the Munich equatorial. The meteorological work was to be continued as usual, with the exception of some changes in the positions of the country stations. The writer has frequently drawn attention to the great importance of establishing systematic observations of gales in New South Wales, with a view to the ultimate adoption of weather signals. The subject was discussed with some interest by the Colonial Philosophical Society, at their meeting held in September, 1864, on the occasion of a paper being read on Australian storms. It was therein shown, from a comparison of the observations made at Adelaide, Deniliquin, Sydney, and Brisbane, that our great atmospheric disturbances move, as a rule, from S.W. to N.E., occupying about two days, on the average, in their transit from the first to the last mentioned place. It is very gratifying to find that due prominence is given to this important subject in the report referred to. The Astronomer receives monthly, from the Superintendent of Pilots, a register of gales as observed at the different ports of the colony. He also suggests the propriety of making it imperative on the master of every vessel entering the port of Sydney, to furnish the Observatory with an extract from the ship's log as to the state of weather over a distance of 500 miles from the coast, up to the time of entering the harbour. Attention is also drawn, at the close of the report, to the desirability of the measurement of an arc of the meridian in the colony, of obtaining a first-class meridian circle for the Observatory, and of removing the establishment itself to some more eligible site. The most important work expected from our national Observatory is doubtless the formation of a catalogue of stars of the southern hemisphere. The published catalogues of Lacaille and Brisbane, though embracing a great number of stars down to the seventh magnitude, are confessedly too inaccurate for the refined purposes of modern astronomy. Their defects are almost wholly due to the imperfections of the instruments employed. The telescope employed by Lacaille had an aperture of only half an inch, and 26¼ inches focal length; while the large transit

instrument employed at the Parramatta, and subsequently at the Sydney Observatory, had defects of construction which it was impossible to correct in observation. These defects have been pointed out, both by Mr. Rümker and Mr. Scott. An extension of Argelander's survey of the northern hemisphere, southward, has been several times proposed in Europe, but has only recently been taken up, I believe, by the Observatories at Madras, the Cape of Good Hope, Santiago, and Melbourne. I presume Sydney, owing to the want of a first-class meridian circle, does not join in this important work. The four volumes of observations by Mr. Scott, however, are a valuable contribution of our knowledge of the southern heavens.

In closing this brief sketch of the progress and present state of Astronomy in New South Wales, the writer confidently hopes that, before long, private observatories of a high class, equal to those in the mother-country and on the continent of Europe, will spring up among us to assist the national establishment in the promotion of the science.

JOHN TEBBUTT, Jun.

Windsor, July 10th, 1866.

REMARKS ON THE SEDIMENTARY FORMATIONS OF NEW SOUTH WALES,

ILLUSTRATED BY REFERENCES TO OTHER PROVINCES OF AUSTRALIA.

By the Rev. W. B. CLARKE, M.A., F.G.S., F.R.G.S., Member of the Geological Societies of France and Austria.

If we inspect the map of Australia, we observe that the coasts of Victoria, New South Wales, and Queensland follow the general directions (with some irregularity) of the Cordillera, or elevated land separating the waters flowing directly to the coast from those which, draining the interior, disembogue to the south-west.

The Murray River receives some part of its tributaries from the highlands of Victoria, and others from New South Wales; whilst the Darling and its tributaries collect the remainder of the supply, from as far north as 24° south.

The Cordillera thus sweeps round in an irregular curve from west to east to the head of the Murray, and thence northerly and north-easterly, to the head of the Condamine; trending north-westerly from that point to 21° south, whence it strikes to the north, terminating its course at Cape Melville, in 14° south, about the meridian of 144° 30′, which is that of Mount Alexander in Victoria.

The more westerly and southerly trend of drainage is represented by the Thomson and Barcoo Rivers, which carry off the waters of the Cordillera at the back of the Barrier Ranges to Spencer's Gulf. The meridian of the head of that gulf is, therefore, the western limit of East Australia.

The Cordillera itself, described in part by Strzelecki in 1845, was traced by him through a considerable part of its diversified course (as understood by him), from the southern part of Tasmania to the parallel of 28°, in longitude 152°; but not further westward than 146° on the parallel of Mount Alexander. It is, however, doubtful whether the ranges between this furthest western point and Wilson's Promontory, where he considers the chain cut off by the sea, is anything more than a spur in that direction.

But the extent of the Cordillera westerly, to its termination on the border of South Australia, is so well defined that there can be no question that the south-west and west extension has as true a character as any part of the northern prolongation. This may be geologically deduced from researches of the Geological Survey of Victoria. That province is limited, at its eastern corner, by a line joining Cape Howe and the head of the Murray, so that the boundary crosses very near the highest point of all Australia, which Strzelecki made 6500 feet above the sea, but which subsequent observations have shown to be 7175 feet. This correction rests on observations made by myself, in 1852, and a re-discussion of them in comparison with results obtained by Professor Neumayer in 1862. On 8th May, 1852, I made the highest point of Kosciusko 4077 feet above my then base, at 3098 feet above the sea, which therefore came out 7175 feet; and in February, 1863, Professor Neumayer wrote me word that he made the highest peak in November, 1862, 7176 feet. This makes

Kosciusko's summit above the crossing place of the Indi or Hume River at Groggan's, 5425 feet.

The 144th meridian to the northwards limits very nearly all the high land of the east coast to Cape Melville, whilst the 142nd meridian limits to the westward the basin of the Darling, including part of the drainage along the Thomson and Barcoo from the head of the Flinders to where it passes into South Australia, or the 141st meridian.

Thus, all this enormous drainage of New South Wales and south-western Queensland is, as it were, bounded by ranges of high geological antiquity, the Grey and Barrier groups being of undoubted similar age to the mass of the Eastern Cordillera.

It has long been known that the strike of the older sedimentary rocks all through the Cordillera, in Victoria, as well as in New South Wales, is generally meridional; so that in the former province the beds strike across the Cordillera, whilst in the latter they form various angles from parallelism with it to a transverse direction, as the chain doubles and winds irregularly in its course.

This is the experience of the Victoria Survey; and my own traverses across various points of the Cordillera in New South Wales and Victoria, establish the fact of a normal meridional strike of the older strata. So distinct, indeed, is this characteristic, that the settlers in various parts of the country have been accustomed to trace the direction of north and south by the strike of the slates.

It sometimes happens that, owing to the high angle of dip, and the effect of denudation on the overlying formations, the Cordillera itself becomes in places almost knife-edged, so that in New South Wales it presents occasionally a *divisa aquarum* not more than nine paces in width; whilst in Maneero to the south, and New England to the north, it spreads out in a plateau, on which eastern and western waters rise close together and sometimes overlap. These different features have a variable geological aspect as well as value; for owing to the strike of the older rocks, the breadth of the Silurian formations, which, as in other countries, are repeated by recurring folds, may be more exposed in Victoria than they are in New South Wales; and owing to the curve of the Cordillera, probably the same beds are traceable to the north which occur in the south—as, for example, the auriferous rocks of Omeo and Peak Downs, which are on the same meridian; and thus the meridional strike is exhibited along the north-east coast, where there are alternations of old rocks forming precipitous cliffs, with low valleys and beaches separating those alternations.

Independently of this arrangement, the whole of the central area inside the eastern Cordillera has a trend to the south and west, so that the waters collected between 22° and 37° south, on the east of South Australia, find their way to the sea at the eastern corner of that province.

We might naturally assume that this order of deposits is to be expected throughout the Cordillera, but there is a singular exception. Whilst marine deposits of Tertiary age are found along the coast of Western Australia, and along the southern coast from Cape Leuwin to Cape Howe, there are no known *marine* Tertiaries in any part of the coast of New South Wales and Queensland up to the Cape York Peninsula; and the reason of this may be, that, as indicated by the phenomena before pointed out by me, but which on this occasion cannot be further dwelt upon, the

eastern extension of Australia has been cut off, perhaps by a general sinking (which is in accordance with the Barrier Reef theory of Mr. Darwin), and which has some support from the fact thas there is repetition of Australian formations in the Louisiade Archipelago, New Caledonia, and New Zealand, in the latter of which occur abundant tertiary deposits, in which case the intervening ocean may be supposed to cover either a great synclinal depression or a denuded series of folds.

Relatively speaking, therefore, the Cordillera of the eastern coast has not been subject to the changes which introduced the relics of a Tertiary ocean. At any rate, no evidence is known to me of *marine* Tertiaries on the lands north of Cape Howe.

Another fact worthy of notice, as showing the probable ancient geological vicissitudes of Australia is, that the great carboniferous series which is so prominent in New South Wales and in parts of Queensland, but which is less distributed in Victoria, and there only partially and irregularly as to the portions still remaining, has been broken up and carried away, so as to have left the various members dislocated, ruined, and separated in such a way as to allow no clear view to be taken of the whole till all the separate portions have been separately examined; and to the want of this personal examination on the part of certain palæontologists and others, who have never yet seen the carboniferous formation of New South Wales, is to be attributed the perseverance with which they so long disputed facts as attested by geologists in New South Wales who are familiar with the latter and with Victoria also.

In consequence of the absence of marine Tertiary deposits in New South Wales, and the occurrence of a more complete series of the strata in the sections of the carboniferous formation, there has arisen a difficulty in collating the gold deposits with those of Victoria; and, in this respect, at present the upper deposits in the former province cannot be assigned with any precision to the epochs adapted by Mr. Selwyn for the latter. And it also follows that his view of the distinct ages of Pliocene auriferous and Miocene non-auriferous gravels cannot be tested in New South Wales; if indeed it has not already been tested by the actual discovery of gold in the so-called Miocene deposits themselves as they occur in Victoria.

So far as is at present known, the gold is derived chiefly from the Lower Silurian formation; but researches conducted for me at H.M. Mint in Sydney, prove that it exists in almost every distinctive rock in New South Wales. In this province the alluvial deposits are not so extensive as in Victoria; but this probably arises from the fact previously mentioned of the strike being in Victoria transverse to the direction of the Cordillera, by which means the currents which distributed the drift had a wider area of gold-bearing materials to denude than in New South Wales, where, I conclude from numerous examples, the principal currents were to northward, so that in that province they would coincide with the direction of the Cordillera, and not accumulate the deposits in such low-lying extensive regions as those of the Murray districts. The same objection would obtain, on the supposition of gradual waste and accumulation from less powerful agency than that of a general rush of water. It is not, however, to be doubted, that there is an enormous amount of gold yet untouched in numerous places in New South Wales, not only in the quartz lodes (or reefs), but in gullies and plains where alluvial gold diggings will yet be discovered.

The distinctive differences in material mineral wealth between Victoria and New South Wales are not altogether confined to gold or tin, which latter metal is well represented in the New South Wales Court; but coal, iron, and copper, and perhaps lead, also exhibited, prove more than an equivalent of the great amount of gold at present in Victoria.

At the Universal Exhibition of 1854 the present writer exhibited a collection of rocks and fossils, illustrating the whole of the geological formations of Australia, and these were enumerated in their stratigraphical order in the published catalogue. On this occasion, it has not been possible to complete a similar and more extended collection, owing to the effects of protracted illness; but it may be useful to introduce a few remarks on the various geological epochs as they represent themselves in New South Wales, with a brief statement as to their connection with other portions of Australasia.

Azoic and "Metamorphic" Rocks.

There has not been sufficient evidence yet collected to show that these rocks have been ascertained to exist in Eastern Australia, although in Tasmania rocks of a doubtful class (and which may, perhaps, be only highly altered Lower Silurian) have been referred to them by Mr. Gould. The existence of gneissoid strata and of slates of very ancient aspect has also been well known in New South Wales, with occasional unfossiliferous limestones; but it would be premature to place them, without doubt, under the present head. Some of those mentioned under the First Epoch of Strzelecki have, on close inspection, appeared to the writer to be merely the products of transmutation, nor is such an improbable result, seeing that in Australia some slates have apparently been changed into granitic rocks. It is, at least, certain that such rocks, except in Tasmania, generally occur in the immediate vicinity of granites, though the latter frequently occupy large areas both in Maneero and in New England, as well as along the Cordillera, and in independent masses along the coast. In Western Australia, where an enormous region is occupied by granites, and the older formations are represented only by small patches of slates, whilst the granites themselves remain bare, these patches are found on the flanks of the granitic bosses, and at extremely wide intervals; nor have I been able to detect, among the numerous collections which have passed through my hands, any distinct evidence of any but doubtful examples of those foliated rocks which belong to the so-called Primary epoch. In Southern Australia, also, there does not appear to be any considerable amount of strata which could be referred to this epoch.

Lower Palæozoic Rocks.

Of these there are undoubted evidences in some limited districts of Tasmania, whilst in New South Wales and Queensland considerabla areas are occupied by them.

The greater mass of them, in the two latter provinces, appears to belong to Upper and Middle Silurian; the mudstones of Yarralumla, with Encrinurus and Calymene; the Coralline and Pentamerus beds of Deleget and Colalamine; the Tentaculite and Halcytes Beds of Wellington and Cavan; and the beds with Calymene, Encrinurus, Beyrichia, and others with Illœnus, Harpes, Bronteus; Brachiopoda, including Strophodonta and Radiata embracing Star-fishes, point to the existence of at least

the Upper Silurian formation on both flanks of the southern part of the Cordillera. There are also numerous corals included in the list given by me in the Southern Goldfields (p. 285), which also confirm the same determination; and it may be added that the above, and other fossils of this age mentioned by me elsewhere, have been examined by Palæontologists of eminence in Europe. Such are the genera Favosites, Cœnites, Ptychophyllum, Calamapora, Syringopora, Emmonsia, Alveolites, and Cystophyllum, &c. These, perhaps, might not alone satisfy a doubt, but with them occurs Receptaculites; since 1858, when these were determined, I have detected Halysites, which may settle the question as to Upper Silurian. Wenlock beds seem to be well developed on the Deleget.

In Victoria, numerous species of Grapolites have been found, but during my explorations of New South Wales I discovered none. It is only recently that they have been found in the most southern part of the province on the M'Loughlan River, and also in other spots in the basin of the Snowy River, near the boundary of Victoria.

In Tasmania I saw fossils similar to those of New South Wales, from beds on the Gordon and Franklin Rivers; but Mr. Gould has since placed them partly as Lower Silurian. Lower Silurian beds also occur on the Deleget River, where both the upper and lower have a generally meridional strike, but varying dips.

In Queensland, Mr. Daintree has confirmed the fact of the existence there of Silurian rocks identical with those of Victoria; and my own examination of the Brisbane Slates led me to compare them with the auriferous slates of the Anderson's Creek goldfield. The quartz veins of that neighbourhood were found by me in 1851 to hold gold, and some very recent researches have increased the expectation of valuable deposits there, in addition to those which have already been opened on the Burnet, Crocodile Creek, Mount Wyatt, the Burdekin, Talgai, and Star Creek; about Peak Downs, and in other places.

The goldfield of Fingal in Tasmania is also partly occupied by rocks of Silurian age, the lithological structure of which is identical with rocks in New South Wales and Victoria.

Copper is abundant in strata which may be referred to the same epoch; but a peculiarity which I have observed in most of the copper localities is, that the ores do not occur in lodes of the usual character, but sometimes, as on Peak Downs in Queensland, they follow the planes of the strata, and generally in New South Wales assume a dome-like form, rising in bosses at intervals without continuous surface connection. The Burra Burra Copper Mine of South Australia has also something of the same character. I have in my possession Pentamerus from Bombala, in which the shells are embedded in copper ore.

Specimens are exhibited from Bombala and Cavan, not only of Fossils, but of Copper, Lead, and Iron.

Middle Palæozoic Rocks.

Mr. Jukes has shown cause why the term Devonian should be eliminated, referring the so-called beds to the bottom of the Carboniferous formation.

It is probable that such will have to be the fate of certain strata in Australia, the fossils of which have at once a Silurian and a Carboniferous aspect; being connected with the former by certain corals, and with the

latter by the occurrence of Lepidodendron, Sigillaria, and other Lower Carboniferous plants.

There is undoubtedly a regular passage downwards from the marine fossils of the acknowledged Lower Carboniferous beds of New South Wales to others which very much resemble the so-called Devonian beds of England; and a series of shells, corals, &c., from the Murrumbidgee, which I submitted some years ago to Messrs. Salter and Lonsdale, through Sir R. I. Murchison, Bart.,* excited doubts as to their belonging to any but Silurian and Carboniferous deposits. Among these were Phanerotinus, Loxonema, Atrypa *reticularis*, Orthis *resupinata*, Murchisonia, Strophomena, and Spirifera of various species, some like Devonian. Loxonema is known to me as occurring in the lower marine beds of the Hunter River basin—certainly below the upper coal-beds.

There appears to be an intermixture, and such is the case with certain strata to the westward of Wellington, in which some of the fossils have the Carboniferous type and others the Silurian. In the list before mentioned these are included in Passage Beds.

In Victoria, near Mount Tambo, in Gippsland, and again near the head of the Murray, there are some limestone beds with fossils, which I visited in 1851, and then believed to be of the same age as the lowest Carboniferous rocks of New South Wales. The Victorian geologists consider them Devonian.

In Queensland, the Burnet Range, and tracts about the Bowen goldfield and Burdekin (in which river limestones with fossils occur), are strewn with spoils of a formation which Mr. Daintree calls Devonian. From the former locality I have had many collections, and among them all I find Productus in alliance with Trilobites, which appear to be older than Carboniferous. But, if Mr. Jukes's arrangement holds good, these will probably be placed in the latter formation. On the western flanks of the Cordillera, near Yass, and on the eastern, along the Shoalhaven River, and again near the Hanging Rock, New South Wales presents numerous bands of limestone full of such fossils; and it may be doubtful at present whether these lie on the horizon of the Devonian, or whether they belong to some portion of the Upper Silurian. As these beds appear to range all through the country on a nearly meridonial strike, on both sides of the Cordillera, they are traceable in widely different places; and it may eventually be determined that, though in close contact, there is really a distinction of formations, only to be detected by accurate survey. So far as Lepidodendron is concerned, that plant occurs in some places in association with beds that are decidedly younger than any called Devonian, near Pallal on the Horton River, and on the Manilla River in Liverpool Plains, and in the gold drift of the Turon River, which has been derived from beds of transmuted sandstone belonging to the coal-beds at the head of the river. Near Wellington, also, Lepidodendron has been found in hardened rock of similar origin. At Canoona goldfield, in Queensland, Lepidodendron occurs in hardened shales; and at Goonoo Goonoo, on the Peel River, in New South Wales, it occurs in fine grey sandstone, with Ferns and Sigillaria in close proximity to beds of marine fossils which are certainly Lower Carboniferous.

Besides these fossiliferous evidences of supposed Devonian age, there

* See Murchison's *Siluria*, 3rd ed., p. 296.

are beds of grit, sandstone, and conglomerate, occupying positions of extreme doubtfulness as to age, not only in Victoria, but also all along the coast ranges of New South Wales, which, as described by me, and confirmed by Mr. Daintree, are certainly older than some parts of the Carboniferous formation. They make a near approach to the "Old Red" of Europe. In my report to the Government of New South Wales (6th March, 1852), I have mentioned that I have traced these beds "from the head of the Shoalhaven to the head of the Genoa;" and Mr. Daintree, in his report to Mr. Selwyn, Director of the Victorian Survey (26th May, 1863), adopts my description, word for word, as applicable to "the Grampian sandstones, the conglomerates south of Mount Macedon, of the Avon River and Tambo, Gippsland;" and he adds, "there can be little doubt they are all members of one great formation."

At Mount Tambo, according to Mr. Selwyn (1866), they underlie the limestone of that locality, which he therefore considers as probably Carboniferous; and this, as stated above, was my view in 1851.

About Eden (Twofold Bay), and Panbula and Merrimbula, to the north, there occur a series of beds which, in 1851, I also ranked as Devonian; but on visiting the district in 1865, I was inclined to think they might be much older. Nevertheless, they are connected with Porphyries, with double-headed hexahedral crystals of quartz, which are common in countries assumed to be of the age of "Old Red." After all, there will have to be an adjustment of this and other questions, which may hereafter distribute very differently parts of formations which at present are considered fixed.

In Western Australia, Mr. H. Gregory indicated on his map, and in his report, the existence of Devonian rocks near York, and in other parts of that colony. Having examined the rocks so indicated, I can only state my belief that they have no pretension to any such antiquity, and are probably mere collections of loose granitic matter and other drift cemented by ferruginous paste, which has since become transmuted into concretionary nodules and hæmatite. There are also pebbles of trap, much decomposed, in the so-called Devonian.

Upper Palæozoic.

That this division of rocks is fairly represented in New South Wales there can be no dispute. It has been long determined by all palæontologists that the lower Carboniferous marine beds of Europe are represented by the beds immediately below the upper coal measures of the Hunter River, of the Illawarra, Talbragar, &c.; and we know also that fossils of the same age occur in a part of Western Australia, near the Irwin River in Queensland, in Tasmania, and in Victoria.

Associated with them, both above and below, in New South Wales, coal-beds of various thickness (from 3 to 30 feet) occur. In the Newcastle basin alone there are at least 16 seams more than 3 feet thick, sections of which have been published by John Mackenzie and W. B. Clarke, and are exhibited. Up to a comparatively recent period, it was not known that under the marine beds below these coal seams other seams occur bearing the same genera of plants as in the upper beds, of which Glossopteris and Phyllotheca are very abundant. When this fact was first published by me, it gave rise to controversy; but the truth of my conclusions has been confirmed since by Mr. Daintree,

who, visiting and examining the spot in dispute, found four or five seams in the position to which they had been assigned. Now, below these lower coal measures there is an enormous thickness of fossiliferous strata, in which the fossils (as before stated) gradually assume what has been called a Devonian aspect. The opposition to this determination has arisen from a preconceived idea that strata bearing Glossopteris could not be Palæozoic, and therefore that the upper coal measures of Newcastle had no right to be considered older than *Oolitic*. But whilst these upper measures produced a fish of undoubted Palæozoic character (Urosthenes *australis*), Cleithrolepis *granulatus*, Myriolepis *Clarkei*, and other Icthyolites, examined and determined by Sir P. de M. G. Egerton, Bart., to be Palæozoic, have been found by me at least 1000 feet higher, and of which photographs are exhibited on this occasion.

This dispute, therefore, ought long ago to have been settled; but unfortunately it was taken up out of the colony, and found some support in the writings of De Zigno, author of "*Le Piante Fossili dell' Oolite.*" Since then he has modified his views, and, in a subsequent publication, in the "*Rivista Periodica*," Padova, vol. xiii., 1863, admits that the Australian coal-beds are rather *Triassic* than *Oolitic*. He still, however, does not quite comprehend the whole question.

Above the coal measures, including Urosthenes and Glossopteris—*i.e.*, in the Hawkesbury and Wianamatta beds, in which Cleithrolepis, Myriolepis, and Palæoniscus occur without Glossopteris—Baron de Zigno imagines, from the way in which the evidence has been put before him, that beds with Pentacrinites, Ammonites, and Belemnites, which will be mentioned hereafter, interpolate the beds with Palæoniscus, &c. Nothing, however, of the kind has ever been found in Hawkesbury or Wianamatta beds; and the only fossils of the genera named occur in Queensland, full 600 miles distant. Professor M'Coy having believed the coal of New South Wales to be Oolitic, and also believing the Pentacrinites, &c., to be Oolitic also, and Lepidodendron having been stated to be found in beds below the coal in marine beds of assumed Devonian age, it was too hastily inferred that Professor M'Coy and myself were writing of two distinct *coal* epochs.

That the coal measures of New South Wales are, however, truly Carboniferous, has been since determined by plant evidence; for in Queensland, where the Newcastle coal measures can be identified, a plant very near to, if not the same as, Alethopteris *lonchitica*, has been found, and there are in the present Exhibition several examples of it. Moreover, near Stroud I long ago detected a magnificent fern, in beds which belong to the Hunter River coal measures, which Sir C. Bunbury has named *Adiantites eximius*.

Whether the masses of coal exhibited look more like a Secondary than a Palæozoic coal, may be fairly left to the decision of competent judges.

Another ground on which the age of the New South Wales coal-beds was disputed is, that in Victoria there are certain beds which *(me teste)* resemble some of my Wianamatta beds, and, therefore, assuming them to be *Oolitic*, New South Wales was involved in that dictum also. Now, the true European coal measures (according to Mr. Selwyn), "so far as is known at present, do not exist in Victoria;" nor has Glossopteris been found there at all. Moreover, the Survey has sunk through 4000 feet of

consecutive beds, without finding a profitable seam anywhere; and, though the limestones of Gippsland are acknowledged as Lower Carboniferous or Devonian, there is not an atom of evidence to be obtained in Victoria as to the Secondary age of the New South Wales coal. Thus stands the question at this moment. If now we turn to Tasmania, we have clear evidence as to the occurrence there of true Palæozoic coal, and if we pass on to Queensland we have equally clear evidence; and, what is more, there are sections on the Bowen River (full 1000 miles from Sydney) in which the whole history of the coal-beds may be read off without error.

Mr. Daintree writes thus:—"The Bowen River coal series would afford more conclusive sections in the upper portion than your own; since, besides the seams of coal lying at the base of the Bowen River series, *interstratified with beds containing a marine fauna*, which Professor M'Coy acknowledges to be *Carboniferous*, there are likewise beds *containing a nearly similar fauna, resting on beds with abundance of imbedded Glossopteris.*"

I learn also, from the examination of both fauna and flora, specimens of which were in my possession before Mr. Daintree had visited Queensland, that the former contains the identical species described by M'Coy (*Annals Nat. Hist.*, vol. xx.), such as Productus *brachythærus*, Pachydomus *globosus*, Allorisma *curvatum*, whilst the latter contains Phyllotheca *australis* and Glossopteris *Browniana*, and others, which were assumed to be Oolitic at Newcastle, but must be admitted to be Palæozoic on the Bowen River.

The coal-seams on the Bowen River are of variable thickness, but a ten-foot seam has been noticed.

Mr. Gould, in his report to the Government of Tasmania, October, 1861, also states that the Mersey River worked coal-seam belongs to the formation with the same marine fossils as in Queensland, and on the Hunter in New South Wales.

Having visited the Tasmanian locality for the purpose of inspection, I can confirm all that has been stated respecting the occurrence of the marine Palæozoic fossils, Orthonota, Spirifera, Fenestella, Pachydomus, Theca, &c., in association with and immediately above the coal.

So far, then, the question about the age of some of the Australian coal must be considered as settled; and if, as in Illawarra, the coal-beds overlie the marine beds, as they do also in the Fingal district of Tasmania, it would appear that all these separate occurrences belong to one thick series, in which marine beds and fresh-water beds interpolate each other. But, assuredly, in that case, the arrangement adopted must express the order as follows:—

1. Upper coal measures.
2. Upper marine beds.
3. Lower coal measures.
4. Lower marine beds.

So far as I know, the latter rest frequently on a conglomerate, which in Tasmania I found to contain undoubted Carboniferous fossils.

Since the Exhibition of 1862, on which occasion, in a paper on the Coal-fields, I noticed the occurrence of Oil-bearing Cannel Coal at the foot of Mount York, and at Colley Creek in the Liverpool Ranges (not on eastern

waters), the former has been in great request for the purpose of producing illuminating oils, and the produce has been brought into the market. In the former locality, and in Burragorang, I have made some recent researches, which have satisfied me that these can only belong to the upper coal measures, for they bear distinct evidence in the fronds of Glossopteris, which are very clearly impressed upon the beds at Mount York; whilst at Burragorang the blocks of Cannel are found in an intermediate position, between the top of the coal measures and the upper marine beds, which, if not the overlying measures, bear the very strongest resemblance to the Hunter River series.

In Illawarra, also, there are shales which are above that geological position, and which produce oil for illumination, but are not of the peculiar character of the Cannel at Mount York, which, in a great degree, resembles the Bog Head mineral of Scotland, only it is more valuable. Specimens of all the products under the present heading will be found in the Exhibition. It has been an object of inquiry whether Petroleum springs exist in New South Wales. Such have been reported from the Corong in South Australia, and from Taranaki in New Zealand, and from Victoria. The former is, we learn, a mistake; being probably at a point where certain animal substances have decomposed. In New South Wales there are also two localities, known to me for many years, in which Petroleum exudes; and there are two or three in Western Australia, the products from which I have examined. Nothing of value has as yet been found.

SECONDARY ROCKS.

I have previously made mention of the Hawkesbury and Wianamatta beds; and a collection of them, illustrated by a catalogue, was exhibited at Melbourne. Some of these were also shown in the Universal Exhibition of 1854, and therefore have not now been repeated.

Whether they be acknowledged hereafter as Palæozoic (which the fishes determined by Sir P. M. de G. Egerton, Bart., would justify), or whether, with Mr. Selwyn, we consider them (against that evidence) to be Secondary—or whether we suppose, with him, that the beds in Victoria called by him Secondary are a portion of my Wianamatta beds—there is nothing to explain the statement made by De Zigno, in his valuable paper read before the Academy of Science, in Padua, on 23rd April, 1863, in which he says:—

"Altri depositi pure d' incerta classificazione ci si schierano innanzi prendendo ad esaminare i terreni a combustibile fossile della Nuova Galles meridionale e della Tasmania, che il M'Coy aveva fino dal 1847, collocati nel piano dell' Oolite, mentre Clarke annunciava di avervi rinvenuto i Lepidodendri dell' epoca carbonifera.

"Successivamente le nuove indaggini instituite dal M'Coy lo ponevano in grado di chiarire come i resti trovati dal Clarke appartenessero a depossiti collocati ad una grande distanza di quelli le cui piante accenavano ad un' epoca più recente.

* * * * * * * *

"Egli cita in questi ultimi depositi la presenzadi quattro Cicadee e di una *Tæniopteris* multo affine alla *Tæniopteris vittata* dell' Oolite di

Scarborough, e nota come presso Volumbilla abbia trovato Belenniti, Pentacriniti e varie conchiglie che s' approssiomano alle specie proprie dell' Oolite inferiore, del Lias e del Trias" (p. 148-9).

Now, in this statement are three things to be considered :—

1. It has not been said by me that the Lepidodendron, &c., were in the same beds with Glossopteris (though evidence has come out recently to the effect that these plants have been found together at Newcastle), but it has been held that the Glossopteris coal beds and the Lepidodendron beds are part and parcel of one great formation.
2. In New South Wales no Cycadites and no Tæniopteris have been ever found, though they occur in Victoria in the beds considered by the geologists there to belong to the Wianamatta beds.
3. Neither in the Victoria beds, nor in the Wianamatta beds, has ever been found a Belemnite, a Pentacrinite, or any shell, save a fresh-water Unio in Victoria, and one shell in New South Wales from the fish-bearing shales.

There is, however, a far more important matter to be rectified.

When I first reported the discovery of Secondary fossils from Wollumbilla in Queensland, it was as *Cretaceous or Jurassic;* but Professor M'Coy described them in September, 1861, as *Lower Secondary,* and as the marine representatives of the formation to which belonged, in his opinion, the Victoria "carbonaceous" beds, and the coal measures of New South Wales—*i.e.*, of the age of the Scarborough Oolite. Among the Wollumbilla fossils were some which looked older than Cretaceous ; and therefore, certainly guided by Professor M'Coy's determination, I adopted his view of an older period, and even considered that some of the fossils indicated a Triassic age (there was certainly a brachiopod which looked older than Triassic), consenting to the possibility that the Wollumbilla beds might prove really to be of the same age as the Wianamatta beds. But I have learned two things since—first, that the fishes of the latter are Palæozoic; and secondly, that the Wollumbilla fossils on comparison and examination in Europe, whither I sent them, are by geologists there considered to be really *Cretaceous;* and as Professor M'Coy has himself published two Cretaceous species from Queensland, in 1865, and as I have collected evidence to geologically connect their localities (Flinders River) with that of Wollumbilla (though otherwise so widely separate), there will be the less difficulty in allowing the Cretaceous epoch, first suggested by myself as applicable to fossils in *situ,* to be acknowleged as well developed in Queensland. But we shall then see how little is its relationship with the Wianamatta, and how still less with the Victorian beds.

This reference to a very important circumstance leads me to suggest, that whether the Wianamatta series is to maintain a Palæozoic pretension, or whether it is to ascend to the Trias, the arrangement which will be found most correct will probably be represented somewhat in this wise :—

1. Cretaceous. Wollumbilla, Flinders, &c. (Queensland), and Western Australia.
2. Inferior, or Great Oolite. Deposits at Wizard Peak, &c., Western Australia.

3. Trias. Victoria.
4. Palæozoic. Wianamatta, Hawkesbury, and coal-beds of New South Wales.

In which arrangement I would place the Victorian "carbonaceous" above my Wianamatta beds. Of course, subsequent discoveries may modify such a view, and lead to a final settlement of opinion, by enabling geologists to fill up the *gaps* which undoubtedly exist; proving, perhaps, that the Cretaceous fossils picked up in drift by Mr. Selwyn indicate the former existence of Upper Secondary rocks in that province, as the Ammonite brought to me on the Clarence River coalfield in 1853 may indicate the former presence there of an Oolitic formation.

That Cretaceous or Jurassic rocks formerly occupied and still occupy an enormous range in Queensland, I can now assert, having obtained some of the additional information which I proposed to collect in 1861. I have now been able to discover that rocks of the above epochs range from the east of Wollumbilla across the Maranoa and Warrego to the Nive and Barcoo; thence along the head of the Thomson to the Flinders, and so round by Tower Hill and the Belyando back to the Amby and Maranoa Rivers; not of course in one uninterrupted area, but resting on the Carboniferous and other Palæozoic formations, thus exhibiting a very extensive distribution of Secondary rocks; and it will probably be found that various groups of the Jurassic epoch are represented there.

It is certainly singular that some well-known species of European reputation, or their representatives, are found in the Western Australia Oolite, such as the following of the Great Oolite:—Trigonia *costata;* Ostrea *Marshii;* Ammonites *Moorei;* Lima *pectiniformis;* Avicula *Munsteri*, &c.

None of these have, however, been found in Queensland, New South Wales, in Victoria, or Tasmania; but in the latter island there are undoubted equivalents of some part of the Wianamatta series, as well as of the coal measures and lower Carboniferous beds of New South Wales.

In New Zealand the greater part of the coal measures is not Palæozoic, but some of it is said to be Secondary, to which epoch also belong the Jurassic Plesiosaurus and Ammonites, and Triassic Aviculæ and Monotis.

In New Caledonia there is also a distinct Triassic series, of which some of the fossils are akin to those of New Zealand; but, at present, neither has this nor the Belemnites of Queensland been found in New South Wales.

So far as the question of Coal is concerned, no Coal seams (but only thin patches or very limited layers) have been found in the Wianamatta or the Hawkesbury rocks, that can be compared even with the alleged Secondary deposits of Victoria; and in Queensland, where workable seams do exist, the fossils of New South Wales are also found. In the Secondary marine beds of Wollumbilla and the Amby, gold in minute visible particles was found by me in some of the quartz pebbles cemented with the shells, and a small quantity was detected by crushing the whole, shells, pebbles, and the calcareous cement together.

Tertiary Rocks.

Throughout the whole of Eastern Australia, including New South Wales and Queensland, no Tertiary *marine* deposits have been discovered. There are, however, in various places of New South Wales patches of

plant deposits which, according to the frequent notices of geologists, may be referred to some period of the Tertiary epoch. A silicified sandstone, or quartzite, of this kind, full of impressions of ferns and leaves of trees, but not known to be now living, occurs at Jerara Creek, not far from Yass. It is probably Miocene. On the summit of the Cordillera, near Nundle, above the Peel River Diggings, occurs a ferruginous bed full of leaves. Both these localities are represented by specimens in the Exhibition. On the Richmond River occurs a white magnesite, full of yellowish impressions of leaves. At Keewong, in the county of Gowen, there is a bluish deposit of fine aluminous matter with black impressions. From a depth of sixty feet in a shaft near Bungonia, a pale yellowish white deposit with similar impressions was brought up; and on the summit of "a made" hill, above Kiandra goldfield, at a height of 4000 feet above the sea, and in a region now partly covered with snow many months in the year, there is a deposit of black clay with such casts of leaves as occur in similar clay near Hyde in New Zealand.

No botanist is prepared to declare what is the exact age of such deposits, but some of the leaves are supposed to represent among others the foliage of *Fagus;* yet, it was only in 1866 that a beech forest was discovered, by the Director of the Botanical Gardens, growing on the Clarence River. On comparing the living leaves with the impressions in the various deposits mentioned, I can see no identity. This is a point in geology not yet fully dealt with.

The most remarkable instance I have met with is on the coast, about forty-two miles north of Cape Howe, where, at a place called Chouta (between Tura and Boonda) a cliff about 100 feet high, formed of sand and white silicate of alumina, contains beds of lignite charged with sulphide of iron, and which are full of phytolites much allied to the living vegetation. From the clays, some of which are nearly kaolin, articles of pottery have been formed, which, with the clays and sands, are exhibited. It has been proved that, by distillation, a fair proportion of lubricating oil may be produced from the lignitiferous clay, and other products are expected to result from these deposits. The cliff is about sixty feet thick from the sea to the top of the clays, and borings below the sea level have shown a still greater thickness.

These deposits lie between the horns of the little bay at Tura and Boonda, resting at one end on the highly-undulating Palæozoic rocks, and at the other on a mass of porphyry. They were formerly, no doubt, deposited in a depression among the slopes of the hills, but the wearing away of the coast has left a cliff of clay and sand instead of the original cliff of hard rocks. It is remarkable that at the south end the rocks assume the character of a breccia of quartz, cemented by silicious matter (probably like a deposit mentioned by Mr. Gould as occurring in Tasmania), and in it analysis has detected the presence of gold, though some quartz veins at the north end contained none.

My impression at first was that the lignite was recent, but I place the deposits under the present head because it may be possible the plants are not recent; and some of the hardened clinker-like sands covering the clays remind me of the sands on the coast of Dorset, at Studland and Bourne Mouth. If this be really a tertiary locality, it does not contradict the general assertion at the commencement of this section, for no shells of any kind have been detected in any part of these beds. Swampy and

stunted plants still grow on the sands, which are very wet, and probably reproducing the phenomena beneath them, with the exception of the white clays, which were in part derived from the decomposed felspathic matter of the porphyry. In various parts of Maneero there are lignite-like local thin deposits, but on analysis they have proved valueless.

It may be well to mention, that although there are no such positive indications as exist in Victoria as to the age of the gold drifts which are by Mr. Selwyn referred to Upper and Middle Tertiary, yet there are parallels in New South Wales to certain phenomena that have been observed in that province. Thus, the gold alluvia of the Uralla resting chiefly on granite are covered by a great thickness of basalt, as in various Victorian fields; and at Lucknow, near Orange, as well as at Uralla, under the basalt and with the gold alluvia are found stems and branches of trees, as is the case at Daylesford, in Victoria.

These may be Miocene, or perhaps Pliocene, but the proof must rest on evidence not yet attainable.

Pleistocene and Recent Accumulations.

In many parts of the existing region, all over the surface, wherever the basal rock is not denuded, as near Sydney, there are local deposits which might be called "till," were any Testacea found in them; and in the interior there are widely-spread accumulations of drift pebbles, which, as on the Hunter and Wollondilly, are rounded by attrition in their long journey from the mountains whence they have been derived. Sometimes, also, the breaking up of conglomerates has contributed to this drift.

In more than one instance it is clear that the present river channels have deepened since the drift first began to crowd their banks. I have traced one of these drift streams, sometimes at great heights above the valleys, for more than eighty miles. In other places I have found upon the surface, as Strzelecki did in other parts, minerals (especially ores of copper, tin, and lead) which were at a great distance from their sources; and in two instances that rare mineral, Molybdate of lead, of which no habitat has ever been yet found.

In the great plains of the interior, bones of various gigantic marsupials, fishes, and reptiles are found bedded in black muddy trappean soil; and on Darling Downs in Queensland univalve and bivalve shells are found in some cases attached to the bones, or deposited over them in a regular series of layers, at intervals of several feet; and of these shells some are yet living in the water-holes of the creeks. These facts are generally known, but it was not till recently that the osseous relics have been found in different creeks throughout the whole of the slopes and plains at the base of the Cordillera in Eastern Australia.

Similar to this are the accumulations of bones in caverns, as at Wellington—at Boree, near the head of the Colo River—at Yesseba on the Macleay River, and other places.

In the Exhibition is a magnificent collection made by Mr. Krefft, from the former locality, and several specimens of bone breccia from the latter place, discovered by Mr. Rudder.

Along the coast are found ranges of Dunes, with a variety of shells, some of them rare, others recent, as on Port Hacking and Cronulla beach; along the shores of Botany Bay; on the great flat between the Hunter

and Port Stephens, and along the Macleay River, which now passes for many miles through the shelly accumulations; and about Moreton Bay and in more northern coast openings, shells and marine refuse form deep deposits, from which, as in Illawarra and Broken Bay, a considerable profit is obtained by dredgers and shell-collectors, for the production of lime.

Mr. Rudder illustrates the case of the Macleay by collections of the shells, and by a carefully-drawn map defining the limits of the Pleistocene deposits.

All along the coast, from Torres' Straits to Bass's Strait, drift pumice may be found wherever there is a lodgment, generally in the north corner of the little shore bays. That this has gone on for ages is apparent, as in one part of the coast south of Sydney there is an accumulation of water-worn pumice, some distance from the shore, and beyond the reach of the present waves. It is supposed to come in during easterly gales from the volcanic islands to the north-east.

Raised beaches occur also at various heights on rocky projections of the coast, indicating elevations of the land, of which there is distinct evidence in the recent period, not only in Moreton Bay; near Sydney, and thence to Bass's Strait; but on both sides of that strait, and as far as Adelaide and King George's Sound. Mr. Selwyn gives data for assuming the elevation of the land to have reached occasionally 4000 feet in Victoria, but he has no evidence of Tertiary marine fossils above 600 feet. Unfortunately, on the eastern coast, having no marine Tertiaries, we have to found our deductions, as respects New South Wales, on less secure data. Yet we have here evidence of another kind, and pot-holed surfaces of considerable extent have been found by me at various heights from 300 to nearly 3000 feet.

In a brief extract like the present it is impossible to quote authorities, nor has time allowed a more satisfactory digest or a wider range of statements; nor has opportunity permitted the preparation of sections (save of the Newcastle Coalfield), or map to point out relative positions of the formations mentioned by me in this paper. The places named can, however, be seen on such maps as are probably exhibited by English publishers; if not, reference can be made to Petermann's map of South-east Australia, in Stieler's Hand Atlas.

I have not named the occurrence of the ferruginous deposits of the Cape York Peninsula (though I possess a map, and collections made from about the new settlement and along the coast), because I am not at present aware whether they are Pleistocene or Tertiary. They are very extensive, and cover the bases of porphyry hills. On analysis of the ironstone, no gold was detected.

St. Leonard's, near Sydney, W. B. C.
17th January, 1867.

NEW SOUTH WALES COALFIELDS.

By WM. KEENE, F.G.S., London; M.A.S., Bordeaux; Corresponding Member Geo. Ins., Vienna; and N.S. Wales Government Examiner of Coalfields.

PALÆOZOIC FOSSILS.

MR. W. KEENE, the Government Examiner of Coalfields, thus describes a very interesting and valuable collection of rocks, fossils, and minerals, exhibited by him :—

"These specimens show the super and sub-carboniferous rocks, and the coal measures, presenting eleven different seams to working, all of which are more or less worked at various levels—from 450 feet below to 1500 feet above the sea.

"The first, second, and third seams are worked in the Illawarra District, at Mount Keira, Bellambi, and Bulli; the third, fourth, fifth, sixth, seventh, and eighth seams are worked at Newcastle and Wallsend, and at Minmi, on the Hunter River; the ninth, tenth, and eleventh, at East and West Maitland, and Branxton, near Dalwood.

"The present shipments from the collieries amount to 20,000 tons weekly."

Referring to the specimens shown in this collection, I may now enter upon some further particulars :—

The seam of the Australian Agricultural Company, worked at the colliery known as the Borehole, is 163 feet from the surface, and 150 feet below the sea level. Its average thickness is about 10 feet, with dip to the south-east of 1 in 20. This coal is highly bituminous, and remarkable, in common with the Borehole and Minmi seams, for its tendency to reniform and orbicular fracture—a peculiarity which appears to belong to the middle seams of the series; the upper and lower seams being more disposed to splinty cleavage, and burning to ash with little cinder. This coal is greatly esteemed in the Melbourne and Californian markets. Ships of large tonnage can load at the staiths of the Company, to which the coal is taken from the pit's mouth by locomotives, a distance of about two miles.

Wallsend Colliery.—The coal in this pit is 127 feet from the surface, and 80 feet below the sea level; 9 feet 10 inches in thickness, including partings, which divide the seam into three bands. The partings are together about 10 inches in thickness. The Wallsend workings are situated about half-way between Minmi and Newcastle, the strata rising towards the north-west ranges. The works connect with Newcastle by a branch railway to join the Great Northern line at Waratah, about four miles from the port, and the locomotives take coals to the ship's side at the rate of 500 tons or more daily.

The Waratah Colliery, near Newcastle, is worked by a Sydney proprietory, and they ship coal by the public cranes at Newcastle Wharf or at Port Waratah, where they have erected a shipping staith of their own, and at which vessels drawing 14 feet of water can load. They have on one occasion shipped as much as 900 tons in a day, and their present out-put is about 3500 tons per week.

Lambton Colliery is near to the Wallsend, and belongs to and is worked

by the Scottish Australian Company. The seam crops out towards the river, but they have worked to the dip till they are now under 300 feet of cover, and their present extraction is about 200,000 tons per annum.

The price of good large round coal at all the Newcastle Collieries is 9s. 3d. per ton delivered on board, and the nut coal 5s. per ton. The Panama line of steamers use Australian coal, and the Dutch Steam Navigation Company, working in the Java and China seas, send here for their supplies.

The Minmi Colliery Company work the seam at 90 feet from the surface, and 20 feet above the sea level. An outcrop of the seam is visible in a creek about 400 yards from the shaft, rising in a northerly direction 1 in 18. It appears to be the second seam below the chert rock which covers the coal and copper company's seam at Burwood, and is bedded on a hard sandstone grit of good building stone. The coal is much liked by the blacksmiths of the district, and the small makes a good coke, as does the small coal of the collieries of the Newcastle district generally. Messrs. J. and A. Brown, the owners of these mines, raise about 300 tons a day, which is shipped at Hexham, a township on the banks of the Hunter River, ten miles from Newcastle; or the coal is sent down in barges laden with boxes, which are hoisted by a steam crane so as to load ships of any tonnage whilst at anchor in the stream. The seam averages six feet of clean coal.

The Four-mile Creek Company carries on its operations in the East Maitland District, near to the head of the navigation of the Hunter River, 15 miles from Newcastle. There are at least three workable seams recognizable in this district; and that worked is 8 feet 6 inches in thickness, 5 feet 6 inches of which is a splint coal of very superior quality, chiefly used by the steamers navigating daily between Morpeth and Sydney.

The admirable regularity with which these ocean steamers perform their service—their engines of 160 horse-power easily kept to the top of their speed with steam to spare and blowing at the valve, give sufficient and constant evidence of the excellence of the coal; in fact, I have long considered, and often expressed the opinion, that good, clean, hand-picked, New South Wales coal is at least equal if not preferable to the best coals of England, when these latter have been twice transhipped; that is to say, in the state in which English coal can alone be got in Sydney, and at double the price of the best produce of our own mines.

The Four-mile Creek is a hard splint coal, does not clinker, and burns to a fine dry ash—is very comparable to the coals shipped from Goole, in Yorkshire, whilst our bituminous coals may be likened in quality to the "Hartley."

Descending the strata, and below all the seams of these collieries, at West Maitland, about five miles north from Four-mile Creek, two seams of cannel and splinty coal are worked, the property of the Hon. Bourn Russell.

This cannel coal is most useful, and chiefly employed for domestic purposes.

Fifteen miles to the northward these lower seams again crop out, in Anvil and Dalwood Creeks, and are worked at Branxton. The coal is in good repute as a steam fuel.

Thirty miles further to the northward, at Rix's Creek, near Singleton, a seam of good coal is worked, and this concludes the collection from the Northern District.

Sixty miles south from Sydney are the ports of Bellambi and Wollongong; and though they cannot be compared for accommodation with the port of Newcastle, the energy of the coal-owners of the district, and the facility with which coals can be worked by "day-levels" from a seven-feet seam, which shows itself in section along many miles of the mountain range, assure to this field a progressive development to prove the inexhaustible resources of New South Wales in mineral fuel; and will be a guarantee to commercial interests that no combination or monopoly can long disturb the regularity of the supply.

By reference to the collection I exhibit, it will be seen that I can recognise eleven distinct seams, which are more or less worked. The same series of seams extends from Newcastle to the Wollongong District, disturbed and broken up only by comparatively modern eruptions of porphyries and basalts.

On the lands of the Australian Agricultural Company, a few miles from Stroud, a seam more than 30 feet in thickness crops out in the length of a creek, and this thickness has been verified by several trial pits sunk on the dip side. There are many partings of shale and fire-clay, and the coal is of various quality in the thickness of the seam; but there is quite sufficient of good coal for profitable working, if its inland position did not render it wholly unavailable, in face of coal so easily accessible from the sea-board as that of Newcastle and Wollongong.

But late researches have laid open very extensive deposits of rich iron ore with limestone in their vicinity, and all near to water-carriage. Such combined advantages may probably dispose so wealthy a company to make the necessary outlay for establishing an iron manufacture, of which the colony stands much in need. Specimens of this iron ore, limestone, and coal may be seen in the mineral frame of the company connected with the coal seam exhibits of New South Wales, which I have had the honour to prepare for the Exhibition.

The discovery of our wealth in brown cannel oil coals, and oil shales, will enable us to manufacture all the oil needful for our own consumption, and even to export the raw article. We know that it exists in many places at wide areas apart, as may be seen by reference to the map; and like to the richness of our coal seams, which richness is not excelled in an equal vertical section in any part of the world, we may expect that the oil shales will be of as great importance in their development; and if we do not find oil springs, we may possess such beds of the solid material as will justify the expenditure of all the capital needful to keep up a steady and unfailing supply of the valuable and varied products which these shales and coals will yield.

The works already in activity at Hartley and America Creek, and others preparing to operate in different localities, with the general approval of the quality of the oil produced, will justify our most sanguine anticipations on this subject.

As regards the geological age of coal in New South Wales, I may repeat what I have already published—that it would be easy to add pages on this subject, if it were not irrelevant to the question with which I am

now occupied, except so far as the geological age of coal is inseparably connected with its commercial value. That is to say—though there may be, and there is, much bad coal in the palæozoic or true carboniferous series, a really good coal in the oolitic, lias, or tertiary deposits is a thing unknown. To class the mineral fuel of New South Wales as belonging to either of these latter formations would be at once to discredit and condemn it in the market of the world, until, despite discredit and condemnation, its merits were discovered, when it would be tardily acknowledged that the condemnation had proceeded from an error in science, arising out of a deficient or too superficial investigation, or the too facile application of inapplicable theories.

"A reference to the collection I exhibit will settle this question, which has been so long and ably contested by the Rev. W. B. Clarke; and, for the reasons stated, I may be permitted a few words more on the subject. All the seams of the New South Wales coal-field, from the lowest which intercalate with silurian fossils (spirifer, radiata, &c.), devonian flora (lepidodendron, cyclopteris, adiantites), and the bellerophon and crinoidea of the mountain limestone, to the highest and latest deposited seams, in which the flora (equisetacæa, asterophyllites, &c.) approach the oolitic character, all are deposited conformably and almost in parallelism, one on the other; covered also conformably by a thousand feet of sandstone, upon which again has been quietly deposited the Wyanamatta beds, which I have called the false coal measures; for with all the appearances of being coal-bearing, they contain no coal, but a flora probably nearer approaching to that of the oolite.

"The lower beds of the coal series of New South Wales are, then, geologically older than any worked in Europe; whilst the upper beds represent the most recent of the European true carboniferous formation. And as all the coal seams, from the silurian upwards, are deposited conformably, I must conclude that this portion of the globe was comparatively free from violent eruptions and disturbances from the silurian to the permian epoch, and that the alternate submergences and elevations of the land must have been slow and gradual.

"In stating my opinion here as to the age of the carboniferous deposits of New South Wales, I am in part repeating only what I reported after my first examination in this field in 1853. I then wrote :—'The coal is a true coal, not lignite, or a deposit of the tertiary epoch, but belongs to true coal formation—is overlaid by regular beds of secondary sandstone, lying in conformable strata upon it.'"

W. KEENE,
Government Examiner of Coal-fields;
F.G.S., London; M.A.S. of Bordeaux;
Cor. Mem. Geo. Ins. of Vienna.

Newcastle, New South Wales,
10th January, 1867.

AUSTRALIAN VERTEBRATA

(RECENT AND FOSSIL),

REPRESENTING

ALL THE GENERA KNOWN UP TO THE PRESENT TIME.

WITH NOTES BY GERARD KREFFT, F.L.S., C.M.Z.S., &c.

[The following paper, by Mr. KREFFT, is given in its entirety; and although its value is considerably lessened by the absence of the specimens he refers to, there is yet a large amount of scientific information which cannot fail to be of interest to those acquainted with such investigations.—J. G. K.]

MAMMALIA.

THE arrangement of this group is according to Owen's Cerebral System, as follows :—

Class.	Sub-Class.	Order.	Genus or Family.	Example.
Mammalia	Archencephala	Bimana	Homo	Man.
	Gyrencephala	Carnivora	Digitigrada	Dog.
			Pinnigrada	Seal.
		Sirenia	Halicore	Dugong.
		Cetacea	Delphinidæ	Porpoise
			Balænidæ	Whale.
	Lissencephala	Cheiroptera	Frugivora	Flying Fox.
			Insectivora	Bat.
		Rodentia	Claviculata	Rat.
	Lyencephala	Marsupialia	Rhizophaga	Wombat.
			Poëphaga	Kangaroo.
			Carpophaga	Phalanger.
			Entomophaga	Bandicoot.
			Sarcophaga	Native Cat.
		Monotremata	Echidna	Ant-eater.
			Ornithorhynchus	Duck-bill.

which will show at a glance the order of Mammals which are represented in this country.

ORDER—BIMANA.

Homo.

Melanian variety.—Bones of the extremities found in a cave at Wellington Valley, being—left and right femur, left and right tibia, left and right humerus, portion of fibula.

The following are the measurements of some of the skulls of Australian Aborigines in the collection of the Museum at Sydney :—

Greatest Length.		Breadth.		Depth from the anterior margin of the occipital foramen to the middle of the coronal suture.		Locality.
6	15-16	5	2-16	5	3-16	Brisbane.
7	7-16	5	7-16	——		Hobart Town.
7	8-16	5	5-16	5	9-16	
7	4-16	4	12-16	5	2-16	?
6	13-16	4	15-16	5		?
7	6-16	5	10-16	5	6-16	Mudgee.
7	3-16	5	3-16	5	7-16	?

Greatest Length.		Breadth.		Depth from the anterior margin of the occipital foramen to the middle of the coronal suture.		Locality.
6	3-16	5	6-16	5	1-16	?
6	12-16	5	6-16	4	15-16	?
7		4	15-16	5	5-16	?
7	9-16	5	4-16	5	5-16	?
6	14-16	4	14-16	5	1-16	Brisbane.
7	6-16	5	3-16	5	4-16	?
6	14-16	5	3-16	5	1-16	?
7	9-16	5	11-16	5	10-16	?
6	14-16	4	12-16	5	2-16	?
6	15-16	5	2-16	5	1-16	?
7	6-16	4	15-16	5	4-16	?
7	6-16	5	3-16	4	15-16	?
7	8-16	5	5-16	5	5-16	?
7	1-16	4	15-16	5	4-16	Mudgee.
7	4-16	5	5-16	5	8-16	?
6	14-16	5	12-16	5	13-16	?
6	14-16	5	10-16	5	9-16	?
7	6-16	5	8-16	5	10-16	?
7		5	8-16	5	2-16	?
7		5	3-16	5	5-16	Pine Mountain.
6	14-16	5	6-16	5	7-16	?
6	15-16	5	2-16	5	4-16	Murrumbidgee.
6	14-16	5	8-16	5	8-16	Cape York.
6	15-16	4	12-16	5		Bondi.
8	2-16	5	10-16	5	4-16	Port Fairy.
7	14-16	5	6-16	5	10-16	Hunter's Bay.
7	7-16	5	5-16	5	14-16	Rockhampton.
7	6-16	5	7-16	5	3-16	Do.
7	1-16	5	2-16	5	1-16	Kiama.
6	15-16	5	4-16	4	14-16	Do.
7	11-16	5	7-16	5	9-16	Mudgee?
7	5-16	5	2-16	5	6-16	Brisbane.
7	7-16	5	8-16	5	11-16	Cape York.

ORDER—CARNIVORA.

Digitigrada.—Canis.

Canis dingo.—Photograph of a fine old male in the Museum collection.

Fossil Digitigrada.—The dingo existed in Australia during the time of Diprotodons. Fossil teeth of a species of dog will be found in the collection from the Wellington Caves.

Pinnigrada.—Stenorhynchus.

Stenorhynchus leptonyx.—Photograph of skull.—The seals of the Australian coast frequently ascend rivers to a great distance, and during the time of floods may be carried into some lake or lagoon, whence, after the subsidence of the water, retreat was impossible. Through animals of this kind being left in some extensive lake, the fable of the Bunyip may have arisen. A large seal now in the Australian Museum, captured in fresh water, had devoured a full-grown platypus (Ornithorhinchus anatinus).

ORDER—SIRENIA.

Halicoridæ.—Halicore.

Halicore australis.—Photograph of young.—The dugong, which in former times had a much wider distribution, is now restricted to the north-east coast, and is seldom found south of Brisbane.

Order—Cetacea.

Delphinidæ.—Delphinus.

Delphinus metis.—Photograph of skeleton.—The smaller whales are at times very common in the waters of Port Jackson, but are seldom captured; and for this reason we are as yet profoundly ignorant as to the fact of how many different species visit this coast.

Catodontidæ.—Catodon.

Catodon australis.—Photograph of atlas.—The late Mr. W. S. Macleay first described this southern sperm whale. The original specimen, a skeleton 35 feet long, is now in the Australian Museum.

Meganeuron.

Meganeuron krefftii.—Photograph of cervical vertebræ.

Euphysetes.

Euphysetes macleayii.—Cast of hyoid bones.—Photograph of skeleton.

Balænidæ.—Balæna.

Balæna australis?—Photograph of cervical vertebræ.

Macleayius.

Macleayius australasiensis.—Photograph of cervical vertebræ.

Order—Cheiroptera.

Frugivora.—Pteropus.

Pteropus poliocephalus.—Several species of frugivorous bats inhabit Australia, but all are peculiar to the east and north coast. The present species is the most common in New South Wales, its range extending as far north as Brisbane, in Queensland. The "Kalongs" arrive near Sydney at the beginning of the fruit season, about December, and generally remain until January and February. They commit great ravages in orchards, and destroy many times more fruit than they can eat. In 1864 they appeared in unusually large numbers, so that the very streets of Sydney were alive with them at night. During that year they went further south, and were observed even in the immediate neighbourhood of Melbourne. These bats pass the day-time in some secluded spot, far from their feeding-grounds, and often accumulate on the trees in such numbers that the branches give way under their weight.

Insectivora.—Scotophilus.

Scotophilus morio.—The smaller bats are well represented in Australia, though we do not know a single genus peculiar to the country. The present species is the most common in New South Wales and Queensland.

Order—Rodentia.

Claviculata.—Hydromys.

Hydromys leucogaster.—This curious family of water-rats is, as far as we know, found only in Australia and Tasmania. All the members of this genus are good swimmers and divers, though I have seen them drown

in a tank where they could not rest after half-an-hour's exertion. This may in a measure acccount for the strange fact that no hydromys are found on any of the South Sea Islands or on those of the Indian Archipelago.

Hapalotis.

Hapalotis arboricola.—The present species is an example of the many Hapaloti found in this country. Most of them are arboreal, and many build nests in high trees. The animal mentioned above is very destructive to plantations, in particular to oranges when ripe. It is common near Sydney, and, owing to its habits, has not yet succumbed to the Norway rat. There is a very large number of different species of rodents in Australia, about which we know little or nothing. The difficulty to distinguish one from another is very great, and one and the same rat or mouse has often been described twice over in various stages of growth. A great many examples of each kind are required before questions of this kind can be satisfactorily cleared up, and this is one of the reasons why the rodents are so very scantily represented in the present collection. In the far north very large rats are found, and the Museum has lately acquired a new species from Cape York, which exceeds in size the largest hydromys known.

Fossil Rodents.

The Wellington collection of fossils contains bones and teeth of rats, several of which are similar in their structure to those of the genus Hapalotis.

ORDER—MARSUPIALA.

Rhizophaga.—Phascolomys.

Phascolomys wombat—Photograph of dark brown variety. Victoria. Vertebral formula—cervical 7, dorsal 15, lumbar 9, sacral 2, caudal 11 = 38. Skull between $5\frac{1}{2}$ to $6\frac{3}{4}$ inches long; nasal bones relatively long and narrow; superatympanic excavation very shallow; postpalatine foramina, oblong and of moderate size; scapula, long as compared with its breadth; body of moderate size, and seldom exceeding three feet in length. This species probably inhabits Tasmania, the islands of Bass's Straits, and Victoria.

Phascolomys platyrhinus.—Vertebral formula—cervical 7, dorsal 15, lumbar 4, sacral 2, caudal 16 = 44. Skull from 7 to 8 inches long; nasal bones relatively broad to their length; superatympanic cavity moderately deep; postpalatine foramina triangular, large; scapula broad as compared with its length; body large, generally above 3 feet long. This species was obtained from Dabee, Rylstone, about 150 miles west of Sydney. Mr. Edward K. Cox secured several full-grown males, females, and young, two of which were taken from the pouch of two females. The specimen in the large group is a fine old male; the skeleton that of another male.

Phascolomys latifrons.—Vertebral formula—Cervical 7, dorsal 13, lumbar 6, sacral 2, caudal 19 = 47. Fur, smooth and silky; muzzle hairy; incisors much curved, forming nearly a semicircle—the enamelled surface directed nearly forwards; skull broad in proportion to length; nasal bones relatively very broad; frontal bones broad, presenting a well-marked surface, orbital ridge, and postorbital process; supra-tympania

hollow, very large; foramen magnum oval; transverse processes of caudal vertebræ short and narrow; tail much longer than in the preceding two species; scapula narrow as compared with its breadth. Further particulars about the recent and fossil species of this family will be found in Dr. Murie's excellent paper, published in the *Proceedings of the Zoological Society for* 1865, p. 838, from which I have quoted largely; and I can bear witness to the correctness of his descriptions.

Fossil Species of Phascolomys.

The caves of Wellington Valley and the alluvial flats of the Darling Downs have yielded many interesting fossils, among which are several species of the wombat family. The largest of all is—

Phascolomys magnus?—Cast of left ramus lower jaw. This species has been obtained at King's Creek, Darling Downs.

There are several other smaller species, one identical with P. platyrhinus, the others probably new to science.

Attention is drawn to the cases containing a series of fossil remains from the Wellington Caves, and to the catalogue of these remains. There existed at least two species of wombat in the neighbourhood of Wellington, both referable to recent animals, namely, the P. platyrhinus and the P. latifrons. The latter species is now only found in South Australia.

Poephaga.

Macropus.—Macropus major.

Osphranter.—Osphranter robustus.

Halmaturus.—Halmaturus ualabatus, mastersii, dorsalis, thetidis, brachyrus.

Petrogale.—Petrogale penicillata, xanthopus.

Onychogalea.—Onychogalea lunata.

Lagorchestes.—Lagorchestes leporoides.

Bettongia.—Bettongia rufescens, campestris.

Hypsiprymnus.—Hypsiprymnus murinus.

There is no family of marsupials as largely represented and as widely distributed as the Poëphaga, or kangaroos. They are found from Tasmania to New Guinea, and from the shores of the Pacific to those of the Indian Ocean. They are more or less nocturnal in their habits, shy and timid, and some as fleet as the wind. The female is provided with a pouch containing four teats, and produces one young at the time, though now and then two have been taken from the same pouch.

It would be difficult to define the habitats of the different genera of a group of animals so agile in their movements; and in giving a short account of their geographical distribution, I shall not restrict myself to New South Wales, the more so as many of the older writers, in alluding to this colony, may have referred to localities which are now parts of South Australia, Victoria, or Queensland. The larger species are represented by *Macropus maior*, on the south and east side, and in the interior by *Macropus ocydromus*, on the west coast; whilst another large kangaroo, *Osphranter antelopinus*, is found in the far north. The fine red kangaroo, *Osphranter rufus*, inhabits the plains of the interior, almost from east to west, never approaching the coast; while *Osphranter robustus* is only found in the mountain districts of the eastern parts. Mr.

George Masters, who collected the specimens of mammalia exhibited, has informed me that a very large and savage species of kangaroo was said to inhabit some of the mountain ranges about Spencer's Gulf, in South Australia. We have also had reports from various other travellers, that large kangaroos, far exceeding in size any known species, exist to the north, in the interior of the country. At present, however, no specimens of these large creatures have come to hand.

The smaller species of the genus *Halmaturus* are more restricted in their habitat; still some roam over a very large extent of country. Peculiar to the east coast is *Halmaturus ualabatus,* the only species found near Sydney. Further north occurs *H. ruficollis,* principally on the Clarence River, and on the borders of Queensland another handsome wallaby, *H. dorsalis,* makes its appearance. *H. parryii* is also found in the Northern Districts of N. S. Wales. *H. parma* inhabits the semi-tropical Illawarra District, as does also *H. thetidis.*

In South Australia we find *H. greyi* and *H. derbianus.* On the west coast, *H. hautmanni, parma, brachyurus,* and the fleet and handsome *H. manicatus.* In Tasmania, *H. billardieri* and *H. bennettii* occur.

Each part of the Australian coast has also one or more different kinds of *Petrogale,* namely:—*P. penicillata, longicauda,* and *inornata,* in N. S. Wales—*P. xanthopus* in South Australia—*P. lateralis* in West Australia—and *P. brachyurus* and *P. concinna* on the north-west coast.

The genus *Onychogalea* has a similar distribution. *O. frænata* is peculiar to the plains of the interior, and found from the eastern slopes of the coast range to the junction of the Darling River, where *O. lunata* first appears, and extends within a short distance of the west coast. Another member of this genus, *O. unguifer,* inhabits the north-eastern portion of the continent. Many varieties (I cannot call them species) of the genus *Lagorchestes* roam over the vast plains of the interior, where also the burrowing Bettongias are principally found; the genus Hypsiprymnus inhabiting the forests and scrubs.

Fossil Poephaga.

Macropus.

Macropus—spec. Darling Downs.—Portion of left ramus lower jaw, with three molar teeth and fragment of premolar in situ.

Macropus—spec. Darling Downs.—Portion of the left ramus lower jaw, with three molar teeth. This must have been a large animal, and the structure of the teeth shows some approach to the diprotodontoid form.

Macropus—spec. Darling Downs.—Fragment of the left ramus lower jaw of a still more gigantic kangaroo, showing the last two well-preserved molars.

Macropus—spec. Darling Downs.—Right ramus upper jaw of a large kangaroo, showing the great premolar tooth, which closely resembles the premolar of Thylacoleo carnifex.

Nototherium.

Nototherium—spec. Darling Downs.—Of this gigantic animal a left ramus of the lower jaw is exhibited, showing the root of one of the two incisor teeth, three almost perfect molars, the socket of the first molar, and that of a diminutive premolar; also a left upper jaw.

Diprotodon.

Diprotodon Australis.—Upper and lower jaw, with complete dentition. Upper incisor of young animal.

Thylacoleo.

Thylacoleo carnifex.—A very complete series of all the fragments of this interesting animal in the collection of the Trustees is exhibited, with a view to prove—1st. That the animal did not possess a canine tooth in the lower jaw; 2nd. That in more aged individuals the crown of the great premolar tooth was worn flat, in a similar manner as the corresponding tooth in a Bettongia, proving that the animal could not have been carnivorous; 3rd. That its lower incisor teeth were comparatively small and weak, preventing the animal from preying upon the huge Diprotodons and Nototheriums. The fragments exhibited are—Right ramus lower jaw, almost perfect, containing socket of first premolar, large second premolar, first molar, and socket of tubercular molar. A cast of the root of the lower incisor fitting into the empty socket of the above jaw. The anterior portion of the left ramus lower jaw of another individual of a somewhat larger size, showing large premolar, first molar, and the broken incisor. The large left premolar lower jaw of a more aged individual, showing the much-worn crown. A restored lower jaw, of which the left ramus, except the incisor tooth, is a cast from the original specimen, and identical with the first fragment mentioned above. The caves of Wellington and many other localities in New South Wales, Queensland, South Australia, Victoria, and probably in Western Australia, abound with fossil remains of the kangaroo tribe, from the gigantic Diprotodon to the small Bettongia. The collection of the Australian Museum contains numerous specimens, many of which appear identical with living species, whilst others are too fragmentary for identification. Upper portions of the skull are very scarce; there are, however, a few complete sets of teeth of the upper jaw, and some almost perfect rami of the lower jaw, besides single teeth in abundance. With regard to other portions of the skeleton, the hinder extremities are predominant, the more delicate bones of the arms, &c., being either altogether missing or are very much broken. It was the intention of the Trustees of the Museum to furnish as complete a series as possible for exhibition, but owing to the short time allowed for the completion of this task, the collection cannot be sent.

Carpophaga.

Phalangista.—Phalangista vulpina, cookii, canina.
Petaurista.—Petaurista taguanoides.
Acrobata.—Acrobata pygmæa.
Dromicia.—Dromicia unicolor.
Belideus.—Belideus flaviventer, sciurus, breviceps.
Phascolarctos.—Phascolarctos cinereus.
Tarsipes.—Tarsipes rostratus.

This family, comprising the Petauri, the Phalangers proper, and the small genera Dromicia, Acrobata, and Tarsipes, has its stronghold in the southern portion of Australia, in particular on the south-east coast; not a single Petaurus being found on the plains of the interior, though common Phalangers of the genus Phalangista proper abound. Speaking about the

plains of the interior, I mean the flat country beyond the coast range, as even in mountainous districts, 100 or 200 miles from the coast, Petauri occur, but they are totally absent from the plains watered by the Murray, the Darling, and Murrumbidgee, and I believe not a single species has as yet been discovered in South Australia and on the West Coast.

These animals are strictly nocturnal in their habits, and more or less carnivorous. In the immediate neighbourhood of Sydney, and in the coast district of New South Wales generally, we find Acrobata pygmæa, Petaurus breviceps, Petaurus flaviventer, Petaurista taguanoides, and Dromicia unicolor; of Phalangers, both Phalangista vulpina and P. cookii occur; and to the north of the Hunter River, the short-eared Phalanger (P. canina) makes its appearance, and ranges as far as the Clarence and Richmond River, perhaps further north. The female is provided with a regular pouch containing two nipples, and brings forth one young at the time, though occasionally two are produced.

The common opossum (P. vulpina) has the widest range, and is found, I believe, in every part of Australia. The dark-coloured ring-tailed Phalanger (P. viverrina) is found on the southern and western coast, and on the plains of the interior. A species of Cuscus inhabits the extreme north, where the handsome little Belideus ariel is also found. B. sciurus extends from the southern portions of Queensland to Rockhampton and Port Denison. The singular genus Phascolarctos is peculiar to the forests of the coast range, particularly on the extreme south and south-east coast, though it is also found within the tropics, but does not extend very far north.

Fossil Carpophaga.

Since visiting the Wellington Caves I have obtained many fossil remains of Phalangers, which will be found in the Palæontological collection.

Entomophaga.

Perameles.—Perameles nasuta, obesula.
Peragalea.—Peragalea lagotis.
Chœropus—Chœropus castanotis.
Myrmecobius—Myrmecobius fasciatus.

This family is but scantily represented, and, like the preceding one, has its stronghold in the south-eastern corner of the continent and in Tasmania. All the members are gregarious, and nocturnal in their habits; they possess a pouch, entering upwards, and containing eight nipples, the number of young produced being three at a time. The bandicoots live on both vegetable and animal matter, and are very destructive to farms and gardens, though at the same time they destroy many of the smaller rodents. Some of them make extensive burrows, or inhabit hollow logs; others hide during the day in thick scrubs, or build a kind of rude hut or nest with grass and leaves. They are divided into three genera:—Peragalea, with one species; Chœropus, with one species; and Perameles, with seven species, of which several will probably prove varieties only, as the authors by whom they are described give little or no account of their dentition.

In the immediate neighbourhood of Sydney the largest species is alone found (P. nasuta). Another common species is Perameles obesula, the range of which extends over the whole of the southern part of the continent, from east to west. Though not observed near Sydney now, it has

probably existed in former times, being either destroyed by the early settlers or driven from its haunts by the stronger Perameles nasuta.

Peragalea lagotis, Chœropus castanosis, and Perameles fasciatus, inhabit principally the plains of the interior, from the Lower Lachlan and Murrumbidgee to West Australia.

P. gunnii is said to be peculiar to Tasmania, P. Myosuros to West Australia, and P. Macroura to the far north.

Professor Owen having arranged the curious genus Myrmecobius with this group of animals, it will be necessary to say a few words about it. The banded myrmecobius, or ant-eater, inhabits the western interior, and is first observed to the north of the Murrumbidgee and Lachlan; it extends from there into the colony of South Australia, and as far as Swan River on the west coast. The teeth of this little animal are very numerous, small, and far apart; its tongue is very long, and well adapted for the capture of ants and their larvæ, upon which it is said principally to subsist.

Fossil Entomophaga.

Of fossil remains belonging to any of the preceding genera we know little or nothing. There is no doubt, however, that a species of Perameles existed contemporary with the extinct Diprotodons, as proved by a fragment of the right ramus lower jaw, obtained from the Wellington Caves.

Since visiting the caves, teeth and fragments of bones of several species of Perameles were obtained, one fragment of lower jaw indicating a Perameles the size of a large Peragalea lagotis.

SARCOPHAGA.

Thylacinus.

Thylacinus cynocephalus.—Photograph of skeleton.
Sarcophilus.—Sarcophilus ursinus.—Photograph of skeleton.
Dasyurus.—Dasyurus maculatus, viverrinus, geoffroyi ?
Chætocercus.—Chætocercus cristicauda.
Phascogale.—Phascogale penicillata.
Antechinus.—Antechinus stuartii.
Podabrus:—Podabrus fuliginosus.

The members of this family represent the carnivores proper among marsupials. They range from the size of the smallest mouse to that of a large cat; or, as in the Thylacinus of Tasmania, attaining the proportions of a wolf. The two most ferocious and destructive species—the so-called Tasmanian tiger and devil (Thylacinus cynocephalus and Sarcophilus ursinus) inhabit the island of Tasmania.

In the first-mentioned species, the marsupial bones peculiar to all other animals of this class are absent. The smaller Dasyures are very prolific, producing as many as ten young at the time; the larger ones have six, and the Thylacinus generally four. In all species the pouch is shallow, in some scarcely indicated or altogether absent (Phascogale penicillata); the number of nipples being from six to ten. Their habits are nocturnal, and the greater portion of this group is arboreal. The genus Podabrus, with fine and slender toes, is terrestrial, and a last new genus which I established for Phascogale lanigera, on account of its long hind legs and absent thumb, proposing the name of Antechinomys, for it is also terrestrial, and moves by a succession of jumps.

One or two of the Antechini proper are also found in Tasmania, the remaining species being distributed over the continent of Australia. Of the habits and geographical range of these small creatures we know very little; indeed they are all nocturnal in their habits, and travellers have seldom opportunity to observe them.

The largest of the phascogales (P. penicillata) is found in almost every part of Australia, near the coast districts at least, as the Museum obtained specimens from places within the tropics, from the neighbourhood of Sydney, King George's Sound, and other localities.

The second animal forming the group P. calura is found on the Lower Murray River, in West Australia.

The specimen which furnished me with the typical characters for the genus Chœtocercus inhabits South Australia, and the slender-footed Podabri occur on the coast as well as in the interior.

The spotted Dasyures, known to the colonists as native cats and tiger cats, have also a wide distribution.

The large Dasyures maculatus inhabits Tasmania, and the south and south-eastern portions of Australia, reaching north to almost within the tropics.

The smaller and most common D. viverinus is found in the same district.

D. hallucatus is a native of North Australia. D. geoffroyi prefers the plains of the interior; and a fifth species from South Australia and King George's Sound (probably as yet undescribed) has since been discovered by Mr. George Masters.

Fossil Sarcophaga.

In the collection of fossil remains from Wellington will be found a number of teeth and fragments of bone proving the existence of Thylacinus and Sarcophilus (which are now found in Tasmania only) on the continent of Australia. With these were discovered numerous specimens of bones and teeth belonging to smaller animals of this family, but none as yet referable to the genus Antechinus.

Order—Monotremata.

Echidna.—Echidna hystrix.—The genus Echidna has a very extensive distribution, but is generally found on the rocky coast—never far in the interior; its range on the east coast extends from Cape Howe to Cape York.

Ornithorhynchus.—Ornithorhynchus anatinus.—The so-called platypus or duck bill is found in almost every creek or river of temperate and perhaps tropical Australia; and although by no means scarce, we know as yet little of this curious animal. For further particulars with regard to its habits, I must refer those interested to Dr. Bennett's "*Gatherings,*" and to various papers published by the same author, in the Proceedings of the Zoological Society.

AVES.

Order—Raptores.

Falconidæ.
Haliastur.
  sphenurus.
  leucosternus.
Pandion leucocephalus.
Falco frontatus.
Tinnunculus cenchroides.
Astur approximans.
Jeracidea.
  berigora.
  occidentalis.
Accipiter torquatus.
Milvus affinis.
Elanus scriptus.
Baza subcristata.

ORDER—INCESSORES.

Meropidæ.

Merops ornatus.

Corac' læ.

Eurystomus australis.

Alcedinidæ.

Dacelo.
gigas.
leachii.
Halcyon.
sanctus.
pyrrhopygia.
macleayi.
Alcyone azurea.

Artamidæ.

Artamus sordidus.

Ampelidæ.

Pardalotus.
punctatus.
affinis.

Laniadæ.

Strepera graculina.
Cracticus destructor.
Grallina australis.

Campephaginæ.

Graucalus melanops.
Campephaga humeralis.
Pachycephala.
pectoralis.
gutturalis.
Colluricincla.
harmonica.
parvula.
Falcunculus frontatus.
Oreoica gutturalis.

Dicruridæ.

Dicrurus bracteatus.

Muscicapidæ.

Rhipidura motacilloides.
Seisura inquieta.
Myiagra plumbea.
Monarcha trivirgata.

Saxicolidæ.

Erythrodryas rosea.

Meliphagidæ.

Pomatorhinus superciliosus.
Meliphaga.
novæ hollandiæ.
longirostris.
mystacalis.
australasiana.
sericea.
Glyciphila fulvifrons.
Ptilotis.
chrysotis.
sonora.
leucotis.
auricomis.
cratitia.
flava.
chrysops
penicillatus.
fusca.
Zanthomyza phrygia.
Acanthogenys rufogularis.
Anthochœra.
carunculata.
mellivora.
lunulata.
Acanthorhynchus.
tenuirostris.
superciliosus.
Myzomela sanguinolenta.
Entomyza cyanotis.
Petroica.
multicolor.
goodenovii.
bicolor.
Eopsaltria.
australis.
griseogularis.

Menuridæ.

Menura superba.
Psophodes crepitans.
Malurus.
cyaneus.
melanocephalus.
Acanthiza lineata.
Epthianura albifrons.

Motacillidæ.

Anthus australis.

Fringillidæ.

Estrelda oculea.

Merulidæ.

Pitta strepitans.

Paradiseidæ.

Ptilonorhynchus.
holosericeus.
smithii.
Sericulus chrysocephalus.
Melithreptus.
lunulatus.
chloropsis.
Myzantha.
garrula.
melanophrys.
flavigula.
Dicaeum hirundinaceum.
Zosterops.
dorsalis.
chloronotus.

Epimachidæ.
Ptiloris paradisea.

Certhiadæ.
Climacteris.
scandens.
picumnus.
Sittella.
Chrysoptera.
pileata.

Cuculidæ.
Cuculis.
inornatus.
cineraceus.
Chrysococcyx lucidus.
Scythrops novæ-hollandiæ.

Psittacidæ.
Cacatua galerita.
Calyptorhynchus.
banksii.
leachii.
naso.
Aprosmictus.
scapulatus.
erythropterus.
Platycercus.
bauerii.
tennantii.
semitorquatus.
eximius.
pileatus.
icterotis.
palliceps.
Psephotus hœmatonotus.
Euphema pulchella.
Pezoporus formosus.
Lathamus discolor
Trichoglossus.
swainsonii.
chlorolepidotus.
concinnus.
porphyrocephalus.
pusillus.

ORDER—RASORES.

Columbidæ.

Ptilonopus swainsonii.
Carpophaga.
magnifica.
luctuosa.
Lopholaimus antarticus.
Chalcophaps chrysochlora.
Leucosarcia picata.
Phaps chalcoptera.
Geopelia tranquilla.
Macropgia phasianella.

Turnicidæ.

Synoicus australis.

ORDER—GRALLATORES.

Charadridæ.

Hœmatopus longirostris.
Hiaticula.
monacha.
ruficapilla.
nigrifrons.
Erythrogenis cinctus.

Tringidæ.
Schœniclus australis.

Rallidæ.
Parra gallinacea.

ORDER—NATATORES.

Anatidæ.

Anseranas melanoleuca.
Bernicla jubata.
Nettapus albipennis.
Tadorna radjah.
Anas superciliosa.
Spatula rhynchotis.
Malacorhynchus membranaceus.
Nyroca australis.
Biziura lobata.

Laridæ.
Larus pacificus.

Sternidæ

Thalasseus poliocercus.
Sternula nereis.

The labours of Gould, Swainson, and other writers on Australian Ornithology, have made us well acquainted with this country's Fauna, so that it will be scarcely necessary to draw attention to many well-known facts.

Australia is the land of parrots and honey-eaters, of magnificent lyre-birds and mound-building megapods. There are many other genera peculiar to this part of the world; and, as far as the short time would allow it, these groups have been represented in the Exhibition collection. It is, however, impossible to say much more on this subject at present without encroaching on the writings of well-known ornithologists, to whose

labours those interested in this matter must be referred. With regard to the general belief that Australia has no song-birds, I may state that this is a long-exploded fable.

The number of birds known to us at present amount in round numbers to about 670 species.

REPTILIA.

ORDER—CHELONIA.

Chelydidæ.

Chelymys.
- macquaria. } Rivers of New South
- spec. } Wales.

Chelodina oblonga. King George's Sound, Western Australia.

Chelodina longicollis. Rivers of New South Wales.

Chelonidæ.

Caouana olivacia. Port Jackson.

Chelonia virgata. } East coast of Aus-
Caretta squamata } tralia.

ORDER—SAURIA.

Crocodilidæ.

Crocodilus porosus. Northern Australia.

Varanidæ.

Hydrosaurus varius. New South Wales.
Odatria punctata. Port Denison.

Scincidæ.

Lerista spec. Clarence River.
Pygopus lepidopodus. Sydney.

Hinulia? spec.? King George's Sound. Clarence River. Sydney. Warro, Port Curtis. New South Wales. South Australia.

Keneuxia.
- amaragdina. Viti Levu.
- spec. Viti Levu.

Mocoa guichenoti. Middle Harbour.
Lygosoma australis. King George's Sound.
Omolepida casuarinæ. Botany Swamps.

Siaphos.
- equalis. Randwick.
- spec. Clarence River.

Trachydosaurus.
- rugosus. West Australia.
- asper. Adelaide.

Cyclodus gigas. Long Bay.
Egernia cunninghami. Marubra Bay.

Tropidolepisma.
- kingii. King George's Sound.
- major. Clarence River.

Pygopus spec. King George's Sound.

Lialis punctulata. North Shore. Botany. Clarence River.

Hinulia.
- quoyii. Rose Bay.
- elegans. Clarence River.
- greyii. } King George's Sound.
- labillardieri. }
- tœniolata. Sydney.
- whitei. Sydney.

Geckotidæ.

Diplodactylus.
- vittatus. Murray River. Willoughby Falls.
- ornatus. South Head.
- marmoratus. Clarence River. Warro, Port Curtis.
- spec.? Gray. Clarence River.
- spec.? North-east Coast.

Gehyra oceanica. Viti Levu.

Phyllurus.
- platurus. Double Bay. St. Leonard's.
- inermis. Botany Heads.
- miliusii. North Shore. Manly.

Agamidæ.

Chlamydosaurus kingii. Port Curtis.

Grammatophora.
- cristata. Manly.
- muricata. Bondi.
- barbata. North Shore.
- ornata. Murray River.
- spec.? North-east Coast.
- spec.? Rockhampton.

Moloch horridus. Port Lincoln.

ORDER—OPHIDIA.

INNOCUOUS SNAKES.

Typhlopidæ.

Typhlops rüpellii. Manly. North Shore.

Colubridæ.

Tropidonotus picturatus. Clarence River.

Dendrophidæ.

Dendrophis punctulata. Rose Bay.

Dipsadidæ.

Dipsas fusca. Middle Harbour.

Pythonidæ.

Morelia.

spilotes. Randwick. Port Macquarie. North Shore. South Head.

variegata. King George's Sound. Clarence River.

Nardoa gilbertii. Port Denison.

Enygrus bibronii. Ovalau. (Fiji Islands.)

Section I.—Venomous snakes, the bite of which is not dangerous to man or the larger animals.

Elapidæ.

Brachysoma diadema. Bondi. Port Curtis.

Cacophis krefftii. Clarence River.

Petrodymon cucullatum. Richmond River. Clarence River. Randwick. Bondi.

Vermicella annulata. Randwick. Rose Bay.

Dimenia.

reticulata. Port Denison. Sydney.

superciliosa. Sydney. Western parts of N. S. Wales, South Australia.

Hoplocephalus.

variegatus. Rose Bay. Randwick. Long Bay.

gouldii. Western Districts. Flinders Range.

signatus. Randwick. Botany Swamps. Ditto.

nigrescens. Pittwater. Manly.

pallidiceps. Lambing Flat.

coronatus. King George's Sound.

ramsayi. Goulburn.

nigriceps. South Australia.

minor. King George's Sound.

mastersii. Flinders Range.

Section II.—Venomous snakes, the bite of which is dangerous to man.

Hoplocephalus curtus. Botany Heads. La Pérouse. King George's Sound.

Tropidechis carinata. Clarence River.

Pseudechis porphyriacus. Botany Swamp. Randwick.

Acanthophis antarctica. Randwick. Botany.

Sea Snakes. Hydrophidæ.

Platurus scutatus. South Head. Watson's Bay.

Hydrophis. Australian Coast.

Pelamis bicolor. Bondi Beach. Manly.

BATRACHIA.

I. Series.—*Opisthoglossa oxydactyla* (Swamp Frogs).

Ranidæ.

Mixophyes fasciolatus. Clarence River. Illawarra. Clarence River.

Cystignathidæ.

Cystignathus georgianus. King George's Sound.

Pterophryrnus varius. Sydney. Illawarra. Lake Macquarie.

Platyplectrum marmoratum. Clarence River.

Limnodynastes.

dorsalis. Sydney.

bibroni. Adelaide. King George's Sound.

krefftii Sydney.

Limnodynastes.

tasmaniensis. Sydney. South Australia.

ornatus. Port Denison.

affinis? Clarence River.

spec.? N. S. Wales.

Discoglossidæ.

Chiroleptes australis. Port Denison.

Alytidæ.

Heleioporus albopunctatus. King George's Sound.

Uperoliidæ.

Uperoleia marmorata. Sydney. Illawarra.

Asterophrydidæ.

Cryptotis brevis. Clarence River.

Brachycephalidæ.

Pseudophryne. australis. } North Shore.

Pseudophryne.
- bibroni. North Shore.
- var. australis ? Lake Macquarie.

II. Series.—*Ophistoglossa platydactyla* (Tree Frogs).

SECTION HYLINA.

Polypedatidæ.

Hyperolius bicolor. } Port Denison. Richmond, Hawkesbury River.

Hylodidæ.

Platymantis vitianus. Viti Levu.

Hylidæ.

Litoria.
- aurea. } Sydney. King George's Sound
- spec. ? } Richmond, Hawkesbury River.
- nasuta. Randwick.
- spec. ? Clarence River.
- freycineti. } Warro, Port Curtis. Pine Mountain, Queensland.

Litoria.
- wilcoxi. } Clarence River. Warro, Port Curtis.
- spec. ? North Australia.

Hyla.
- phyllochroa. ewingii. krefftii. peronii. } Sydney.
- spec. ? Murray River.
- adelaidensis. King George's Sound.
- rubella. Port Denison.
- jervisiensis. South Australia.
- verreauxii. South Australia.
- citropus. Ryde, Parramatta River.

Pelodryadidæ.

Pelodryas cœruleus. Sydney.

The geographical position of Australia, its tropical and semi-tropical climate, rocky coast, and sandy plains, are most favourable for the development of reptile life; and its insular situation prevents those peculiar forms which are essentially Australian to spread to the nearest islands, or to the Indian continent. The close alliance of the Australian reptilio-fauna to that of South America was first pointed out by Dr. Günther, to whose able papers on this subject, published in the Zoological Society's proceedings, I must refer those interested.

Of useful reptiles which yield food, oil, or tortoise-shell, I only point out the three species of marine tortoises inhabiting our coast:—The well-known green turtle *(Chelonia virgata)*, the shell-producing hawk-bill *(Caretta squamata)*, and the gigantic "Luth" *(Dermatochelys coriacea)*, famous on account of its valuable oil; the largest specimen captured—fully 9 feet in length—may be seen in the Australian Museum at Sydney. Saurian reptiles are also well represented; but, excepting the crocodile *(Crocodilus porosus)* of the Queensland rivers, none are dangerous to man. In New South Wales no formidable Saurian exists—the largest being the so-called lace-lizard *(Hydrosaurus varius)*, which is fond of eggs, and sometimes devours chickens. All other lizards are small, seldom exceeding two feet in length; and though we have not yet discovered any particularly useful quality in any of them, they may always in cases of necessity serve as an article of food to man, and will easily be found under stones or the bark of trees. The principal Australian genera, with a few from the South Sea Islands, are represented in the collection.

Though snakes are numerous in some parts of the country, yet the bite of a few only is fatal; there are not more than four highly-venomous snakes in New South Wales, and even these hibernate during the cold season. We are not troubled with deadly vipers, puff adders, cobras, or rattle-snakes, as other countries under the same latitude; and the great boas and pythons of India, Africa, and America are represented only by the carpet or diamond

snake *(Morelia spilotes)*, which will rob a hen-roost or swallow a rat, but could not attack larger animals.

It is strange, though true, that a country like Australia, which has often been reported as arid and dry, abounds with frogs; in fact, considering the limited knowledge we have of New Holland, it is almost as rich as the South American region, particularly in tree-fogs *(Hylæ)*, which are altogether absent in India.

The principal genera and the most interesting species of our Batrachians are represented in the collection.

PISCES.

MALACOPTERI.

Anguillidæ.

Anguilla australis. — Creeks near Sydney.

Congeridæ.

Murœnesox sp.? Hunter River.

Malacopterous abdominales.

Clupeidæ.

Chætoessus come. Murray River.

Salmonidæ.

Retropinna richardsonii. — Waikato River, New Zealand.

Galaxidæ.

Galaxias krefftii. — Creeks of N. S. Wales.

Elopidæ.

Megalops setipinnia. — Rivers of N. S. Wales.

Cyprinidæ.

Cyprinus. — Creeks and lagoons near Sydney.

Siluridæ.

Copidoglanis. Queensland Rivers.

ACANTHOPTERI.

Mugilidæ.

Mugil.
- dobula
- compressus. — Rivers of New South Wales.

Gobiidæ.

Eleotris.
- mogurnda. Fitzroy River.
- gobioides. Waikato River, N.Z.
- grandiceps. Hawkesbury River.
- coxii. Cox's River.
- australis. Creeks near Sydney.
- compressus. Clarence River.

Triglidæ.

Platycephalus tasmanius.
Centropogon robustus. — Pitts Lagoon, Hawkesbury River.

Sparidæ.

Chrysophrys australis.
Pagrus unicolor. — Hawkesbury River.

Pristipomatidæ.

Macquaria australasiaca. — Macquarie River.
Therapon.
- unicolor?
- ellipticus. Murray River.

Percidæ.

Oligorus macquariensis. — Murray River.
Psammoperca waigiensis. — Island of Waigu.
Lates colonorum. — Murray and Nepean Rivers.

CONDROPTERYGII.

Plagiostomi.

Hetorodontus phillippii—Port Jackson.

The collection of fishes comprises principally those of our fresh-water streams, and such of the sea-fishes as enter rivers. There are several true marine forms found in mountain streams as well as lagoons—for example, *Centropogon robustus, Platycephalus tasmanius,* and others.

As may be expected from the nature of the country, the Ichthyo-fauna is not rich in genera; and with the exception of the Murray Cod *(Oligorus macquariensis)*, all species are of small size, seldom exceeding 10 lbs. in weight. The most common tribes in our lesser streams are eels *(Anguilla australis)*, a *Galaxias*, and many *Eleotri*. Such shallow lagoons as are connected by creeks with the sea swarm during certain periods of the year with young mullet *(Mugil dobula)*, and even young sharks have been captured in these waters occasionally. Some years ago a few carp were introduced into the creeks of our neighbourhood, and both *Cyprinus gieliob* and *Cyprinus auratus* are now plentiful in the lagoons around Botany Bay. It has been asserted that no fly-fishing is to be enjoyed in Australia; this, however, is a mistake: the sprat *(Megalops setipinnis)* will rise to a fly as lively as a trout, and though of no large size (seldom heavier than a herring), this fish affords considerable sport. But at present we know very little of the fishes found in Australian rivers; those of the interior and the far north contain many new species, and some very strange forms, as *Scleropages leichhardti* discovered in the River Burdekin, by the great traveller whose name it bears. With regard to marine fishes, we possess a multitude of excellent quality for the table, the most common being the bream and schnapper *(Pagrus unicolor)* in various stages of growth, the delicate whiting *(Silago maculata)*, many kinds of flathead *(Platycephalus tasmanius, &c.)*, the gar-fish *(Hemiramphus intermedius)*, and last, but not least, "Sergeant Baker" *(Aulopus purpurissatus)*. It is a healthy sign, that not only our game birds, but also both river and marine fisheries, will be protected; and what with the labours of acclimatisers, to whom we have been already much indebted for many good things, we shall soon be able to raise our fisheries to that position which their importance deserves.

FOSSIL REMAINS OF MAMMALS, BIRDS, AND REPTILES

FROM THE

CAVES OF WELLINGTON VALLEY;

COLLECTED AND DESCRIBED BY GERRARD KREFFT, F.L.S., C.M.Z.S.

The fossils exhibited were collected by order of the Commissioners, in the same caves which the late Sir Thomas Mitchell discovered more than thirty years ago; and as many of these remains may occasion considerable interest amongst scientific men, the following notes will perhaps be of some value :—

"The largest cavern, so well described by the late Sir Thomas Mitchell, did not contain any fossil remains. My researches therein were, however, limited; and it is possible that similar deposits as are found in the second, or breccia cave, may yet be discovered.

"An attempt to obtain a photographic view of the interior, by the aid of the magnesium light, failed, and the artist had to content himself with views of the valley and the bold limestone rocks in the neighbourhood of the caves. Five fine pictures were thus secured, many more being spoiled through the myriads of flies, which penetrated everywhere.

"The second, or breccia cavern, was entered next, the sides of which consist of a kind of tufaceous limestone, full of animal remains. To obtain good pieces out of this crust is very difficult, as the bones are much more brittle than the crust, and crumble to pieces before they can be loosened. So, after breaking out some pieces, at the cost of the few tools on hand, I began to look for specimens at the bottom of the cave, where a good many fragments of fossil and a few recent bones were found, most of which had been those of very small animals. The examination of other parts of the cavern was followed up, with more or less success, till I found a small passage, about 18 inches high and 2 feet wide, which appeared to communicate with a larger vault, but was so completely filled with stones and fine red dust that it took more than half a day to clear it sufficiently to allow a person to creep through. In this vault the remains of bones and teeth became more plentiful, and a good many specimens were secured. The tedious task of examining great heaps of red dust is difficult to conceive, as the fine particles of the deposit, rising in clouds at every movement of the body, often extinguish the candles, and make breathing difficult.

"Nearly every portion of this deposit has been more or less disturbed, and only a single small cavity, about 2 yards long, 2 feet high, and 2 or 3 feet wide, appeared to be in its original state. Inch by inch this was examined, the earth run through a rough sieve, and the fossils remains picked out, yielding a rich harvest of many bones and teeth, among which a left lower incisor of the so-called marsupial lion (Thylacoleo carnifex). This tooth was found within a few feet of the spot where Sir Thomas Mitchell discovered a similar tooth, and a premolar of the Thylacoleo, thirty years ago, figures of which are given in the 'Three Expeditions into the Interior of Eastern Australia' (p. 357, pl. 32, figs. 6, 7, 8, 9, and 10), without name. Professor Owen, in his report on the fossils of the Wellington Caves, does not allude to them.

"It will be impossible in this report to give an account of every bone obtained, or to say with certainty whether all the bones belong to animals now extinct in Australia, as the larger number of them are very much broken. I think, however, that with few exceptions the remains are referable to extinct genera and species.

"I have mentioned before, that some of the bones found were those of recent animals. They are distinguished by not being encrusted by breccia, and show all the properties of recent bone distinctly. As numerous opossums and native cats inhabit the caverns, the presence of such bones with the fossil remains is accounted for. I also observed a few skeletons of recent birds, probably carried in by the animals mentioned. The fossil remains found belong to three distict orders—mammals, birds, and reptiles. In the first group the Marsupials are largely represented by the following genera:—Thylacinus, Sarcophilus, Phalangista, Perameles, Dasyurus, Macropus, Bettongia or Hypsiprymnus, Halmaturus, Diprotodon, Thylacoleo, and Phascolomys, sufficient remains being discovered to prove the existence of the above-mentioned genera, some of which are quite extinct, and some (as Sarcophilus and Thylacinus) are only living in Tasmania now.

"The Placental mammals were as scantily represented in those days as at the present time, the remains found being the teeth and bones of Rodents or rats, and those of a dog. In one of the caverns human remains were obtained, but though very old they are not fossil. I also secured some broken pieces of what appears to be the fifth metatarsal bone of a new animal, resembling the same bone in man. I have not had time to compare all the remains, but I have found already that two distinct species of wombats existed in that part of the country, one allied to the broad-faced or hairy-nosed wombat (Phascolomys latifrons) of South Australia, the other similar to the common wombat (Phascolomys platyrhinus). As far as I can learn from some friends in Wellington, no wombats of any kind are found there now. The presence of reptiles and birds is indicated by several portions of the skull and jaws of the former, and of wing-bones of the latter."

DESCRIPTION

OF THE

NATURAL AND INDUSTRIAL PRODUCTS

OF

QUEENSLAND.

The following particulars are compiled chiefly from official sources by J. G. Knight; the statistical tables are taken from Pugh's Queensland Calendar for 1867.

REPRESENTATIVE COMMISSIONERS AT MELBOURNE:

F. MUELLER, Esq., M.D., F.R.S. | ROBERT CALDWELL, Esq.
CHARLES E. BRIGHT, Esq.

A DESCRIPTION

OF THE

NATURAL AND INDUSTRIAL PRODUCTS

OF

QUEENSLAND.

THE colony of Queensland, originally "Moreton Bay," forms the north-eastern corner of the great Australian Continent. Its present southern boundary commences at Point Danger, in latitude 28° 8′ S., and traverses the mountain range which divides the waters of the Tweed, Richmond, and Clarence Rivers from those of the Logan and Brisbane in a westerly direction, until the line meets the great dividing range, when it takes a southerly course until the 29th parallel of latitude is reached. Thence it follows a lesser range until it meets with the Dumaresq, or Severn River; by that river downwards to its confluence with the M'Intyre River; after which it traverses the devious course of that stream until it again cuts the 29th parallel, and thence it follows that parallel westerly to the 141st meridian of longitude—the eastern boundary of South Australia. This line is preserved as far north as the 26th parallel of latitude, which is the boundary of South Australia in that direction; but the western frontier of Queensland cannot yet be said to be positively defined. On the north the colony is bounded by Torres Straits, and on the east by the isle-studded waters of the Pacific. There exists a probability that the southern boundary of Queensland may be extended to the 30th parallel of latitude.

Queensland was separated from New South Wales by an Act of the Imperial Parliament, and Governor Sir George Bowen assumed the reins of government in December, 1859.

Brisbane, the capital of the colony, is situated twenty-two miles from the mouth of the River Brisbane—a noble stream flowing into Moreton Bay. In this city the head offices of the various departments are located, and the principal commerce of the country is carried on. Ipswich, next in importance to Brisbane, is situated at the head of navigation, on the Bremer, a tributary of the Brisbane River. It is forty-four miles from Brisbane by the winding course of the river, and twenty-five miles by road. Toowoomba, Drayton, Warwick, Dalby, Gayndah, Maryborough, Gladstone, and Rockhampton are also amongst the more important of the thriving and rapidly improving townships of Queensland.

The population of Queensland at the time of the Melbourne Exhibition

of 1861 was 30,059; at the last computation (30th June, 1866) it was 94,710, an increase during five years of 64,651, or more than double in that short period.

The productive qualities of the soil of Queensland are fully equal to those of other Australian colonies, either for pastoral or agricultural purposes. In the latter particular the scrubs and forest-lands on the banks of the rivers and their tributaries are capable of yielding almost every variety of grain, fruit, and spices peculiar to a tropical climate—the eastern side of the dividing range being admirably adapted for the growth of the former, and the table lands on the west side of the same range excelling in the productions of the latter. The great extent of the Queensland territory, both in latitude and longitude, enables its inhabitants to cultivate successfully those productions suited to the various degrees of temperature experienced therein. The English potato, the cabbage, the turnip, the carrot, and the varieties of beans and peas will be found growing in close proximity to the pine-apple, banana, orange, sugar-cane, arrowroot, &c. Along the coast line, from the Clarence to the northern boundary of occupation, comprising some eight degrees of latitude, most, if not all, the productions of the Indies, South America, and not a few of those of Africa, may be successfully and profitably cultivated. The hill-slopes, from their base to their summit, are found to be admirably adapted for the cultivation of the vine, olive, indigo, cinchona, cinnamon, cocoa, allspice, tamarind, nutmeg, clove, tea, coffee, orange, cotton, &c.; and upon the rich extensive lands in the glens or valleys of the rivers near the coast, the sugar-cane, arrowroot, ginger, tobacco, banana, &c., can be produced in the highest perfection.

The wealth of Queensland in forest productions is scarcely to be estimated, most of her timbers being of a kind exceedingly valuable for building and manufacturing purposes. The Moreton Bay Pine is a splendid and handsome tree, the wood of which is said to be superior to that grown in the forests of Canada. The Bunya Bunya *(Araucaria Bidwillii)*, another species of pine, grows plentifully in that portion of the northern country lying between the 25th and 26th parallels of latitude. The tree is remarkable for its great height—sometimes measuring 200 feet—for the singularity of its growth and foliage, and for the peculiar properties of its cone or fruit, which is held to be a great dainty by the aborigines, and resembles the eating chestnut in flavour. The red cedar of the river districts is one of the best and most beautiful woods for manufacturing purposes in the colony, and the ironbark is not only valuable in building, but is remarkably adapted both in strength and durability for ship-building and for constructing bridges and wharves, and also for railway sleepers. In addition to these may be named the bluegum, box, violet wood, silk oak, tulip wood, and forest oak, all of which are plentiful, and the timber exceedingly useful. Independently of these, there are a number of others, such as the cypress pine, the satin and yellow wood trees, and a host of eucalypti.

With the view to encourage intending emigrants to make Queensland their destination, the colonial Government have instituted three different systems under which persons may be assisted in emigrating to Queensland. The Queensland Emigration Office in London is at No. 17, Gracechurch-street, City.

COTTON.

Samples of Queensland cotton, from various localities, hundreds of miles apart, are shown in the present Exhibition, conveying the gratifying fact that Sea Island cotton, of fine texture and quality, can not only be grown in the neighbourhoods of Brisbane, Maryborough, Gladstone, and Rockhampton, but also upon the elevated table lands of the colony; one sample picked from plants grown in a garden at Camboon, upon the Upper Dawson river, a distance of 200 miles from the sea-board, rivals in texture that grown upon the coast.

This interesting fact will give the manufacturers of England some idea of the vastness of the Queensland cotton-field, and show them that there is a colony in Australia from whence a supply of this staple, equal to any demand, can be furnished, so soon as capital and labour are introduced into it for the purpose.

In order to encourage the cultivation of this valuable staple product, the Queensland Commissioners for the Great Exhibition of 1862 felt warranted in offering to purchase all the cotton that might be grown in the colony during the previous year at a fair price (but which was in no way intended to interfere with the liberal bonus offered by the Government—namely, £10 per bale), an encouragement which appears to have been attended with some success, judging from the quantity sent in to the Commissioners.

The specimens of upland cotton, although few, are remarkably fine, and were grown on the coast country. They have a Sea-Island gloss, very unlike the coarse, hairy appearance of the same varieties met with from other parts of the world.

Mr. Pratten, of Cooper's Plains, states that from one acre of cotton (less six rods) about 1200 lbs. of cotton, including the seeds, have been gathered, yielding something over 300 lbs. of a clean, marketable article. Mr. Pratten further observes that the preparation of the ground was not greater than for any other ordinary crop; and the cost of picking (performed by the members of his family) not more than if engaged in other out-door occupations. The quantity of cotton exported in the course of the year 1866 was 707 bales, valued at £20,491.

Extract from a letter of Thomas Bazley, Esq., M.P., to His Excellency Sir George Bowen:—

> "To illustrate the practical benefit to be derived from the supply of cotton as well as sheep's wool from Australia, I have had a few dresses manufactured from the beautifully fine lace thread, No. 250, which I spun from Queensland cotton, and this has been blended with fine yarn made from the wool of the sheep of your colony, and, the experiment being most successful, the result is a fabric of resemblance in softness and beauty to Cashmere."

ARROWROOT.

The quantity of arrowroot manufactured and exported in 1865 was 12,141 lbs. It is generally considered to be equal to the best Bermuda arrowroot; and the reasonableness of its price per pound, and its superior quality, justify the conclusion that it may become an article of considerable export to the neighbouring colonies.

Independent of the produce obtained from the root, those tubers which, from size and imperfection, are not suitable for manufacture, as well as the stalks and leaves, possess very fattening qualities, and are adpated for feeding pigs and other domestic animals.

MAIZE.

The cultivation of maize in Queensland has been more general than any other crop, the returns from the rich brush land situated upon the river's bank being very prolific and remunerating. One great advantage attached to the cultivation of this crop is, that the planting extends over a large space of time, say from the middle of September until the middle of January, the early crop being pulled before Christmas, and the late sowing about the latter end of May. Maize grows equally well upon the table lands as upon the eastern coast, one sample having been grown about 1600 feet above the level of the sea. The cultivation of this plant and the potato have this advantage over their southern neighbours in the parent colony of New South Wales, that their crops ripen at least a month earlier.

WHEAT.

The cultivation of this crop has hitherto been too much neglected in Queensland, although a succession of experimental efforts have demonstrated the perfect practicability of wheat being profitably cultivated both in the eastern and western provinces, thus contradicting what has often been asserted, even by old colonists, that Queensland, with all its great variety of productions, could not grow wheat. That Queensland can not only grow wheat, but very good wheat, the samples exhibited prove. For several years past Mr. J. Fleming and one or two other agriculturists have successfully grown wheat upon their properties in the neighbourhood of Ipswich. At Toowoomba, situate upon the western slopes of the great dividing range of the colony, wheat for several years has been grown of a very fair quality. At Warwick there were 1792 acres under wheat at the end of 1865.

SUGAR.

There were 450 acres of sugar-canes under crop in 1865, and there can be but little doubt that sugar-growing will form one of the industrial occupations of the colony in the course of a few years.

COFFEE.

The soil of Queensland is adapted to the growth of the coffee tree, and furnishes an additional illustration of the capabilities of the colony.

TOBACCO.

Samples, both in leaf and manufactured, were exhibited at the Great Exhibition of 1862. They were grown at Rockhampton.

FIBRE.

Amongst the samples of fibre exhibited were very good specimens obtained from the *Musa textilis* (a variety of the banana), the *Phormium tenax*, and a malvaceous plant *(Sida)*, a weed growing with wild luxuriance in the neighbourhood of Brisbane, which on examination will be found to be of great strength, of average length and fineness, and suitable for a variety of useful purposes.

WOOL.

Wool forms the principal export of Queensland. The exports for the year ending September 30th, 1866, were 33,901 bales, weighing 13,968,879 lbs., valued at £1,019,159.

SILK.

The samples of silk exhibited, although not large in quantity, were of good quality. Only recently attempts have been made to produce this article, and the success that has been already achieved is highly encouraging. The climate of the colony is admirably adapted to the growth of the mulberry and other plants suitable as food for the silk-worm; and there is every inducement to prosecute this important and highly-interesting branch of industry.

PRESERVED MEATS.

Mess beef, tongues, and essence of beef are now largely preserved, and the foundation for a good export trade is already laid. Preserved beef in tins is now being shipped from Grafton, New South Wales, consigned to Messrs. M'Call, of Houndsditch, London, and sold by them at 7d. per lb.

TALLOW.

The quantity of tallow shipped in the course of the year 1865 was 1940 tons.

DUGONG OIL.

This oil is procured from the blubber of the *Halicore dugong*, which is found in great numbers in Moreton Bay, Wide Bay, and other northern harbours. It is exhibited as a new therapeutic agent, and as a substitute for cod liver oil. The distinction between this and the cod liver oil is that it contains no iodine, but it possesses all the advantages of the cod liver oil without its unpleasant smell. The lean portion of the flesh of the animal is excellent eating, the aborigines being excessively fond of it, absolutely gorging themselves with the food when they are so fortunate as to capture one in their fishing expeditions. The skin, which is nearly half an inch thick, can be converted into a gelatine or glue. The bones of the dugong are hard and firm, and take a polish equal to ivory. Specimens of the animal have been caught in Moreton Bay weighing from five to six hundredweight, the fat or blubber yielding from five to seven gallons of oil.

COAL.

Coal is found at the Red Bank coal-pits, near Ipswich, twenty miles from Brisbane. The coal seam is situated on the Brisbane River, near the junction of that river with the Bremer.

COPPER.

Mines in the neighbourhood of Rockhampton have been opened out, and the quantity shipped from that port in 1866 is stated at 397½ tons.

WOODS.

The woods indigenous to Queensland are treated on in Dr. Mueller's report.

STATISTICS.

The statistics that follow are taken from *Pugh's Queensland Almanac* for 1867, and may be regarded as official and correct.

METEOROLOGICAL OBSERVATIONS FOR YEAR ENDING SEPTEMBER 30, 1866;

TAKEN AT BRISBANE BY THE REV. J. BLISS, OBSERVER.

Geographical position of Brisbane.—Lat., 27° 5′ S.; Long., 153° E. Height above Sea Level, 70 feet.

RAIN-FALL.—1865-66.

Year.	Month.	No. of inches.	No. of days' fall	Year.	Month.	No. of inches.	No. of days' fall.
					Forward........	2·29	18 days
1865	October	0·30	2 days	1866	April.................	3·09	15 ,,
,,	November..........	0·83	4 ,,	,,	May..................	3·32	17 ,,
,,	December	0·35	2 ,,	,,	June.................	8·62	15 ,,
1866	January.............			,,	July..................	1·97	10 ,,
,,	February			,,	August..............	4·48	12 ,,
,,	March	0·81	10 ,,	,,	September	0·79	9 ,,
	Forward........	2·29	18 days		Total...........	24·47	96 days

NOTE.—It appears that the rain-gauge was out of order from October to December, and that during January and February the observations were not taken, so that the total fall exceeds that which is registered.

RAIN-FALL FOR 1860, 1861, 1862, 1863, 1864, & 1865.

RAIN-FALL AND NUMBER OF DAYS ON WHICH RAIN FELL IN EACH MONTH.

Months.	1860.		1861.		1862.		1863.		1864.		1865.	
	Inches.	Days' fall.	Inches.	Days' fall.	Inches.	Days' fall.	Inches.	Days' fall.	Inches.	Days' fall.	Inches.	Days' fall.
January............	2·54	9	9·28	17	4·25	12	6·48	19	4·47	15	7·04	10
February	9·64	18	4·58	16	2 61	8	15·14	16	9·33	10	4·09	10
March	6 58	18	8·86	18	6·87	15	14·36	23	9·48	10	0·70	2
April................	7·55	18	10·39	19	0·79	8	6·70	14	3·13	12	0·50	3
May	0·12	4	2·87	9	2·21	9	0·92	9	2·63	15	0·21	2
June	0 96	2	6·88	10	3·00	11	2·75	13	3·01	10	4·28	4
July..................	0·49	7	1 90	7	0·51	2	2·43	11	3·04	7	1·55	4
August	12·39	17	10·41	13	...	...	1·81	9	4·89	4	0·90	3
September	4·18	14	1 83	11	2·71	9	1·07	3	0·98	7	3 36	6
October	3 35	12	2·71	6	0·45	5	9 30	13	1·34	9	*0·30	2
November..........	3·69	10	4·59	12	0·99	9	4 93	5	2·36	7	*0·83	4
December	3·14	15	5·15	17	3·88	10	2·93	11	2·34	8	*0·35	2
Total...	54·63	144	69·44	155	28·27	98	68·82	146	47·00	114	24·11	52

* Instrument out of order.

1866.	MARCH. Max.	MARCH. Mean.	MARCH. Min.	APRIL. Max.	APRIL. Mean.	APRIL. Min.	MAY. Max.	MAY. Mean.	MAY. Min.	JUNE. Max.	JUNE. Mean.	JUNE. Min.
Thermometer (shade) 9 A.M.	83·2	77·7	72·0	79·5	71·2	65·6	71·1	64·1	54·1	68·6	58·2	50·3
Thermometer (shade) 3 P.M.	89·9	88·1	73·0	89·8	79·0	73·1	81·2	72·4	61·7	78·8	68·0	56·0
Thermometer (shade) 9 P.M.	84·8	71·7	67·3	73·6	70·6	63·0	68·8	62·7	46·9	67·9	59·7	47·6
Ditto (maximum shade)	97·2	87·1	81·7	96·2	83·0	75·1	83·2	76·3	66·8	80·1	71·9	56·8
Ditto (minimum shade)	70·0	65·0	60·2	67·0	61·4	52·0	64·1	57·6	47·0	63·5	53·0	38·4
Ditto (minimum on grass)	*Instrument out of order.*			*Instrument out of order.*			63·0	51·6	39·0	62·1	47·9	29·6
Ditto (max. sun—solar radiation)	104·5	97·9	94·2	103·0	93·8	82·2	91·8	85·4	69·2	88·5	79·5	63·8
Barometer (No. of inches reduced to 32° Fahrenheit) 9 A.M.	30·224	30·035	29·767	30·235	30·106	29·915	30·305	30·091	29·722	30·380	30·104	29·829
Barometer 3 P.M.	30·154	29·943	29·603	30·147	30·025	29·778	30·235	30·004	29·615	30·211	30·019	29·601
Barometer 9 P.M.	30·233	30·032	29·732	30·221	30·105	29·740	30·290	30·067	29·725	29·829	29·801	29·772

1866.	JULY. Max.	JULY. Mean.	JULY. Min.	AUGUST. Max.	AUGUST. Mean.	AUGUST. Min.	SEPTEMBER. Max.	SEPTEMBER. Mean.	SEPTEMBER. Min.
Thermometer (shade) 9 A.M.	61·7	54·4	48·0	70·4	59·1	51·0	73·2	66·9	61·7
Thermometer (shade) 3 P.M.	72·6	67·1	60·8	79·7	69·2	58·5	89·0	76·3	71·4
Thermometer (shade) 9 P.M.	60·1	53·3	42·9	68·0	59·6	51·0	74·1	62·5	55·0
Ditto (maximum shade)	77·4	70·4	61·6	80·3	71·9	60·0	89·9	79·8	72·4
Ditto (minimum shade)	57·1	46·1	36·3	59·5	48·6	37·1	61·3	52·6	45·0
Ditto (minimum on grass)	58·3	38·6	30·0	54·8	40·7	28·0	59·8	46·7	37·7
Ditto (maximum sun—solar radiation)	86·3	76·7	62·2	88·3	81·0	60·7	97·0	89·5	78·0
Barometer (No. of inches reduced to 32° Fahrenheit) 9 A.M.	30·301	30·038	29·683	30·406	30·113	29·685	30·248	30·018	29·820
Barometer 3 P.M.	30·201	29·993	29·615	30·380	30·051	29·608	30·180	29·897	29·625
Barometer 9 P.M.	30·253	30·002	29·688	30·356	30·126	29·705	30·240	29·976	29·785

MUNICIPAL COUNCILS.

BRISBANE *(Incorporated September,* 1859.)—Estimated annual value of rateable property, £148,819. Revenue : Government endowment, £3720; rates, ferries, rents, &c., £10,497 19s. : total, £14,217 19s. Expenditure, £15,115 4s. 2d.

IPSWICH *(Incorporated March,* 1860.)—Estimated annual value of rateable property, £44,478. Revenue : Government endowment, £1013 12s. 9d.; rates, ferries, rents, &c., £2489 10s. 6d. : total, £3503 3s. 3d. Expenditure, £4,760 3s. 3d.

TOOWOOMBA *(Incorporated November,* 1860.)—Estimated annual value of rateable property, £26,873. Revenue : Government endowment, £970 9s. 6d. ; rates, &c., £1320 4s. 3d.: total, £2290 13s. 9d. Expenditure, £2370 13s. 7d.

ROCKHAMPTON *(Incorporated December,* 1860.)—Estimated annual value of rateable property, £58,054 10s. Revenue : Government endowment, &c., £17,552 9s.; rates, ferries, &c., £4620 9s. 9d.: total, £22,172 18s. 9d. Expenditure, £14,392 5s. 1d.

MARYBOROUGH *(Incorporated March,* 1861.)—Estimated annual value of rateable property, £2000. Revenue : Government endowment, £2000; rates, ferries, &c., £1025 : total, £3025. Expenditure, £3500.

WARWICK *(Incorporated May,* 1861.)—Estimated annual value of rateable property, £12,928 2s. 4d. Revenue : Government endowment, £424 9s. 6d. ; rates, &c., £646 9s. 11d.: total, £1070 19s. 5d. Expenditure, £1876 2s. 2d.

DRAYTON *(Incorporated July,* 1862.)—Estimated annual value of rateable property, £9890. Revenue: Government endowment, £953 7s. 8d.; rates, &c., £494 10s.: total, £1447 17s. 8d. Expenditure, £1355 13s. 11d.

GLADSTONE *(Incorporated February,* 1863.)—Estimated annual value of rateable property, £6979. Revenue : Government endowment, £417 6s.; rates, &c., £178 0s. 3d.: total, £595 6s. 3d. Expenditure, £669 3s. 7d.

DALBY *(Incorporated August,* 1863.)—Estimated annual value of rateable property, £11,782. Revenue: Government endowment, £1043 15s. 3d.; rates, &c., £473 10s. 11d..: total, £1517 6s. 2d. Expenditure, £2328 10s. 4d.

BOWEN *(Incorporated August,* 1863.)—Estimated annual value of rateable property, £14,778. Revenue : Government endowment, £3236 13s. 6d.; rates, &c., £596 11s. 9d.: total, £3833 5s. 3d. Expenditure, £4387 13s. 6d.

QUEENSLAND RAILWAYS.

SOUTHERN AND WESTERN RAILWAY.—This railway—having its present starting point at the head of navigation, Ipswich, 23 miles from Brisbane, the metropolis—was commenced in March, 1864. It was opened to Grandchester, 21 miles, on 1st August, 1865 ; to Gatton, 38 miles, 1st June, 1866 ; and to Helidon, 49 miles, 1st August, 1866. The further exten-

sions of the line will be opened as follows:—To Toowoomba, 78 miles from Ipswich, 1st June, 1867; Dalby, 130 miles, 1st January, 1868; and to Warwick, 62 miles from Toowoomba, 1st January, 1868. A further extension of 168 miles, to Condamine and Roma, has been surveyed and set out; and from Ipswich to Brisbane, 23 miles. This railway is constructed of a three feet six inch gauge, chiefly on account of the great cost which the adoption of a four feet eight and a-half inch gauge would entail in traversing the difficult country between Ipswich and Toowoomba, where two ranges of hills have to be crossed, of 700 and 1400 feet high respectively above the level of the country at their bases.

Respecting the works on the Main Range incline, 16 miles long, the following facts may be interesting:—

Cuttings.—Two-thirds of the whole length are in cutting. Longest cutting, 26 chains; deepest cutting, 57 feet on the centre line; total number of cuttings, 157.

Embankments.—Of the 16 miles of incline, 4 miles 29 chains are in bank. Greatest length of bank, 28½ chains; greatest depth of bank on centre line of railing, 43 feet; total number of banks, 128. (Between several of the cuttings there are viaducts, and no embankments.)

Bridges.—Total length of bridging, 5196 feet, or nearly one mile; total number of bridges, 47. In one place there are eight bridges in three-quarters of a mile of line. Length of longest bridge, 535 feet; greatest height of bridges, 73 feet on centre line of railway.

Culverts.—There are 175 masonry culverts on the incline, varying from two feet to eight feet span.

Tunnels.—There are nine tunnels; total length, 45½ chains; all of which require brick or stone lining.

Curves.—There are 126 curves, of which 49 are of five chains radius, averaging seven chains in length, being a total length of over three miles of five chains radius curves—nearly one-fifth of the whole length of incline.

Gradients.—Steepest gradient, 1 in 50, of which 91 chains are continuous; total length of 1 in 50, 4 miles 14 chains; average gradient on incline, 1 in 70. Total rise, 1195 feet.

On the lesser range two tunnels occur: one of one-third of a mile in length, the other six chains in length, on a curve of six chains radius. At Ipswich the railway crosses the River Bremer by a double Warren iron girder bridge, of three spans of 150 feet each, the roadway being 70 feet above the bed of the river. This bridge, 35 feet wide, carries both railway and the ordinary road, and cost under £20,000; whereas the Menangle Viaduct in New South Wales, of precisely similar dimensions, cost £79,000. The average cost per mile of this railway from Ipswich to Dalby and Warwick, 192 miles, will be under £9000 per mile, including every expense. The extension from Dalby to Roma may be constructed at a cost under £7000 per mile, including every expense. The most cheaply constructed of the broader gauge railways is that in Victoria from Sandhurst to Echuca, the average cost of which was £12,054, exclusive, however, of land and surveys, and engineering superintendence; while the cost of the 52 miles of three feet six inch gauge line from Toowoomba to Dalby, including everything, does not exceed £5000 per mile.

IMMIGRATION.

RETURN SHOWING THE NUMBER OF IMMIGRANTS ARRIVED IN THE COLONY FROM JANUARY 1, 1860, TO NOVEMBER 30, 1866.

Year.	Commissioners' Ships.				Land Order Ships.				German Ships.				Grand Total.
	No.	Males.	Fem.	Total.	No.	Males.	Fem.	Total.	No.	Males.	Fem.	Total.	
1860	1	*256	223	479	...	...	...	...	...	...	...	...	479
1861	2	420	379	799	4	249	153	402	...	...	...	...	1,201
1862	8	913	995	1,908	15	3,371	2,188	5,559	2	419	204	623	8,090
1863	4	621	522	1,143	21	5,489	3,550	9,039	5	1,056	489	1,545	11,727
1864	7	1,267	1,015	2,282	14	2,506	1,534	4,040	3	587	271	858	7,180
1865	5	768	717	1,485	21	5,933	3,561	9,494	6	1,091	680	1,771	12,750
1866	†4	561	596	1,157	17	4,358	2,769	7,127	4	733	571	1,304	9,588
	31	4,806	4,447	9,253	92	21,906	13,755	35,601	20	3,886	2,215	6,101	51,015

* A portion of these arrived *via* Sydney. † To November 30th.

N.B.—At the close of 1866, although the Immigration Act had not been repealed, its operations may be said to have been suspended, as Mr. Jordan's office was abolished.

POPULATION.

The following figures have been compiled from official returns:—

Population in 1846 (by census) ...	2,257
,, in 1851 (,,) ...	8,575
,, in 1856 (,,) ...	17,082
,, in 1861 (,,) ...	30,059
,, on 31st December, 1861 ...	34,367
,, on 30th June, 1862 ...	38,198
,, on 31st December, 1862 ...	45,077
,, on 30th June, 1863 ...	50,879
,, on 1st January, 1864 (by census) ...	61,467
,, on 30th June, 1864 ...	67,181
,, on 31st December, 1864 ...	74,036
,, on 30th June, 1865 ...	78,757
,, on 31st December, 1865 ...	87,775
,, on 30th June, 1866 ...	94,710

REVENUE AND EXPENDITURE.

Year		Actual Revenue.			Actual Expenditure.		
*1859	...	£6,475	17	8	£8,689	10	7
1860	...	178,589	8	5	180,103	9	6
1861	...	238,238	9	1	255,180	4	7
	Loan	73,300	0	0	63,210	1	11
1862	...	295,286	8	1	317,026	10	3
	Loan	53,800	0	0	50,290	4	4
1863	...	295,215	5	7	355,791	14	1
	Loan	125,000	0	0	63,470	18	1
1864	...	369,425	6	3	439,034	18	6
	Loan	300,000	0	0	401,421	6	10
1865	...	†631,431	17	11	617,996	8	1
	Loan	582,750	0	0	685,246	6	11

The above figures are taken from the Auditor-General's yearly reports.

* For December only.

† This amount includes cancelled Land Orders, which had hitherto been kept separate as an item.

IMPORTS AND EXPORTS.

	Imports.	Exports.	Excess of Imports over Exports.
1860	£742,023	£523,476	£218,547
1861	967,950	709,598	258,352
1862	1,323,509	793,236	530,283
1863	1,713,263	888,381	824,882
1864	2,267,954	1,247,054	1,020,900
1865	2,505,559	1,153,464	1,352,095

LIVE STOCK.

RETURN SHOWING THE NUMBER OF LIVE STOCK IN THE COLONY ON THE 31ST DECEMBER, 1865.

DISTRICTS.	Horses.	Cattle.	Sheep.	Pigs.
Banana	895	5,610	278,122	74
Bowen	860	31,864	183,957	191
Brisbane	5,237	57,596	4,189	5,848
Cardwell (no returns)	...	...	...	...
Charleville (incomplete)	2,500	41,072	372,512	25
Clermont	1,178	9,264	490,086	139
Condamine	566	8,025	98,466	15
Dalby	2,090	24,993	685,897	335
Drayton and Toowoomba	3,892	19,009	521,079	1,526
Gayndah	3,239	75,362	741,922	202
Gladstone	1,520	48,858	56,406	454
Goondiwindi	3,960	31,726	122,076	276
Ipswich	7,098	112,429	115,575	2,889
Leyburn	1,005	19,106	245,001	305
Logan	221	2,024	304	280
Mackay	367	11,043	87,040	86
Mitchell (incomplete)	331	5,297	148,581	...
Nanango	1,493	28,003	120,621	74
Princhester	517	19,313	57,779	158
Rockhampton	2,836	27,399	299,532	1,411
Roma (return for 1864)	679	9,929	439,395	...
Somerset	21	300	45	20
Springsure	1,021	7,770	456,419	80
St. George	2,972	101,430	176,773	46
Surat	535	30,624	142,161	30
Taroom	1,117	8,846	372,051	8
Warwick	2,845	29,933	267,250	1,213
Waverley	703	13,881	164,907	65
Wide Bay	1,384	76,730	44,020	263
Total	51,091	848,346	6,594,966	14,888
Return for 1864	40,678	882,073	5,665,334	12,066
Increase	10,413	...	929,632	2,822
Decrease	...	33,727	...	...

RETURN OF LANDS SOLD

BY THE GOVERNMENT FROM 1860 TO 1865 INCLUSIVE.

	Area.	Value.
1860	23,587a. 1r. 21p.	£37,830 17 2
1861	51,815 2 14	88,722 17 7
1862	77,666 2 36	106,240 17 0
1863	55,266 3 38	100,806 17 2
1864	134,842 0 20	205,753 13 5
1865	138,855 0 20	217,459 3 3
Total	582,033 3 29	£756,814 6 4

AGRICULTURAL RETURN.

SHOWING THE AREA OF LAND UNDER CULTIVATION IN EACH DISTRICT ON 31ST DECEMBER, 1865.

DISTRICT.	DESCRIPTION OF CROP.								TOTAL.*
	Wheat.	Maize.	Potatoes.	Cotton.	Sugar-Cane.	Gardens.	Vine-yards.	Other Crops.	
	A. R.	A. R.	A. R.	A. R.	A. R.	A. R.	A. R.	A. R.	A. R.
Banana	...	2 2	...	...	...	3 2	1 0	...	7 0
Bowen	...	22 2	...	...	0 1	18 0	0 2	25 2	61 3
Brisbane	18 0	2,078 2	526 1	249 0	316 0¼	498 2¼	41 0¼	851 3¼	4,574 1
Condamine	...	3 0	2 2	...	...	1 2	...	0 2	7 2
Dalby	...	21 0¾	1 1¾	...	...	24 2	5 3	4 0	56 3½
Drayton and Toowoomba	238 2¼	1,086 3½	381 1¾	...	0 0¾	49 2	21 1¼	326 0	2,103 3¾
Gayndah	...	33 1	14 0¼	0 1	...	32 0	3 2	33 2	116 2¾
Gladstone	...	18 2	1 1	7 0	...	66 3½	...	0 1	93 3½
Goondiwindi	...	...	0 3	...	...	6 0	1 0¼	...	7 3¼
Ipswich	2 2	692 3½	63 2½	180 1	...	145 3	3 3¼	594 2	1,683 1¾
Leyburn	16 0	13 0	3 2	...	...	10 2	5 1	18 1	66 2
Logan	...	328 1	122 2	29 0	...	16 2¼	1 0	[illegible] 0	506 0
Mackay	...	20 2	...	4 0	20 0	...	...	...	44 2
Maryborough	1 1	323 3	40 0¼	4 2	112 2¾	68 0	3 0¾	105 0	659 0¾
Nanango	...	22 2	1 0	...	...	8 0	1 2	34 0	67 0
Princhester	...	...	...	...	...	5 2	...	...	5 2
Rockhampton	...	103 1	6 0	3 1	0 2	106 2½	7 3	113 1	340 2½
Springsure	...	3 0	...	...	...	0 2	...	3 0	6 2
St. George	...	1 2	...	...	...	2 2	1 0	...	5 0
Taroom	...	2 2¼	0 2	0 2	...	10 0	0 0	1 0	15 1¼
Warwick	1,792 1	1,466 1	142 0¼	...	...	28 0	11 1	543 3	3,983 2½
Waverley	...	...	...	...	...	0 2	...	...	0 2
Totals	2,068 2¼	6,243 3¼	1,306 3¾	477 3	449 2½	1,092 3½	109 3¼	2,664 0¾	14,413 0¾

* Omitting perches.

There are no returns from Charleville, Clermont, Mitchell, Somerset, or Surat.

N.B.—The total return of cultivated land in 1864 was 12,005 acres 0¼ rood.

IMPORTS.

The subjoined returns show the value of the imports into the various ports of the colony during the year ending September 30, 1866, distinguishing the amount for each quarter :—

BRISBANE.

Quarter ending December 31st, 1865	£478,863
,, ,, March 31st, 1866	579,324
,, ,, June 30th, ,, ...	480,616
,, ,, Sept. 30th, ,, ...	364,588
Total	£1,903,391
Return for same period of 1864-5	1,881,459
Increase	£21,932

MARYBOROUGH.

Quarter ending December 31st, 1865	£20,216
,, ,, March 31st, 1866	23,994
,, ,, June 30th, ,, ...	19,189
,, ,, Sept. 30th, ,, ...	25,865
Total	£89,264
Return for same period of 1864-5	91,274
Decrease	£2,010

GLADSTONE.

Quarter ending December 31st, 1865	£5,826
,, ,, March 31st, 1866	1,276
,, ,, June 30th ,, ...	4,541
,, ,, Sept. 30th ,, ...	3,772
Total	£15,415
Return for same period of 1864-5	19,240
Decrease	£3,825

ROCKHAMPTON.

Quarter ending December 31st, 1865	£87,006
,, ,, March 31st, 1866	86,110
,, ,, June 30th ,, ...	91,411
,, ,, Sept. 30th ,, ...	29,555
Total	£294,082
Return for same period of 1864-5	336,007
Increase	£58,075

BOWEN (PORT DENISON).

Quarter ending December 31st, 1865	£24,705
,, ,, March 31st, 1866	13,917
,, ,, June 30th ,, ...	12,260
,, ,, Sept. 30th ,, ...	11,683
Total	£62,565
Return for same period of 1864-5	95,809
Decrease	£33,244

CLEVELAND BAY.

Quarter ending December 31st, 1865	£570
,, ,, March 31st, 1866	8,623
,, ,, June 30th ,, ...	7,549
,, ,, Sept. 30th ,, ...	10,448
Total	£27,190

ROCKINGHAM BAY.

Quarter ending 30th June, 1866	£1,812

RECAPITULATION.

Brisbane (year ending Sept. 30th, 1866)	£1,903,391
Maryborough ,, ,, ,, ...	89,264
Gladstone ,, ,, ,, ...	15,415
Rockhampton ,, ,, ,, ...	394,082
Bowen (Port Denison) ,, ,, ...	62,565
Cleveland Bay ,, ,, ,, ...	27,190
Rockingham Bay ,, ,, ...	1,812
Total	£2,493,719
Return for year ending Sept. 30th, 1865	2,423,789
Increase	£69,930

EXPORTS.

The following returns show the amount and value of the exports from each port of the colony during the twelve months ending September 30, 1866:—

Wool, 18,868 bales, weighing 7,683,050 lbs.	£599,034
Tallow, 720 tons 1 cwt. 1 qr. 32 lbs.	23,241
Hides, 36,726 in number	18,460
Sheep and Calf Skins, 1234 packages	3,332
Horns, Hoofs, and Bones	1,168
Beef (salted)	9,759
Cotton, 707 bales, weighing 206,952 lbs.	20,491
Gold, 3773 ozs. 10 dwts.	13,218
Timber, 925,027 feet	7,262
Fruit, 1574 packages	1,715
General Merchandise	68,575
Total	£766,255

The annexed return shows the progressive increase of the exports from Brisbane during the past ten years (each year ending September 30th):—

1857	£355,237	1862	£553,826
1858	363,515	1863	535,930
1859	429,984	1864	651,182
1860	435,744	1865	723,765
1861	467,323	1866	766,255

MARYBOROUGH.

Wool, 1924 bales, weighing 880,226 lbs.	£73,771
Tallow, 194 tons 2 cwt.	8,069
Hides, 4225 in number	2,133
Sheepskins, 496 packages	866
Extract of Meat, 83 packages	695
Tongues, 39 packages	91
Sheep, 198 in number	150
Cattle, 180 in number	720
Horses, 5 in number	180
Bones and Horns	20
Timber (sawn and round), 601,317 feet	3,240
Gold, 98 ozs. 8 dwts. 18 grs.	332
General Merchandise	1,820
Total	£92,087

GLADSTONE (PORT CURTIS).*

Wool, 653 bales, weighing 306,692 lbs.	£22,776
Tallow, 368 tons 8 cwt.	15,362
Hides, 3783 in number	2,709
Sheepskins, 721 packages	1,396
Horned Cattle, 5523 in number	25,507
Sheep, 1881 in number	1,000
Horses, 37 in number	640
Beef, 235 tierces	1,770
Tongues, 40 casks	248
Bones and Horns	125
Gold, 4070 ozs. 9 dwts. 21 grs.	14,334
General Merchandise	2,212
Total	£88,079

* The exports from Baffle Creek, amounting to £21,021, are included in the Gladstone return.

ROCKHAMPTON.

Wool, 10,470 bales, weighing 4,132,652 lbs.	£275,205
Tallow, 262 tons 1 cwt. 3 qrs.	9,864
Hides, 4726 in number	2,842
Sheepskins, 338 packages	2,518
Bones and Horns, 70 tons	159
Beef, 279 casks and tierces	1,378
Sheep, 300 in number	150
Horses, 3 in number	90
Gold, 9628 ozs. 7 dwts. 22 grs.	36,909
Copper, 397 tons 10 cwt. 1 qr. 21 lbs.	31,181
Copper Ore, 240 bags	175
Limestone, 483 tons	225
General Merchandise	5,821
Total	£366,417

BOWEN (PORT DENISON).

Wool, 1298 bales, weighing 624,568 lbs.	£32,755
Tallow, 70 tons 7 cwt.	2,555
Hides, 1197 in number	635
Sheepskins, 45 packages	714
Sheep, 300 in number	150
Cattle, 75 in number	300
Beef, 11 casks	46
Beche-le-mer, 25 tons	1,700
Timber, 12,000 feet	120
General Merchandise	296
Total	£39,271

CLEVELAND BAY.

Wool, 684 bales, weighing 341,691 lbs.	£15,618
Tallow, 220 tons 14 cwt.	8,480
Hides, 2163 in number	1,233
Sheepskins, 20 packages	[illegible]
Gold, 120 ozs. 16 dwts.	440
General Merchandise	307
Total	£26,176

RECAPITULATION.

Port of Brisbane	£766,255
,, Maryborough	92,087
,, Gladstone	88,079
,, Rockhampton	366,417
,, Bowen (Port Denison)	39,271
,, Cleveland Bay	26,176
Total	£1,378,285

. The total export of wool for the twelve months ending September 30th, 1866, amounted to 33,901 bales, weighing 13,968,879 lbs., valued at £1,019,159.

NOTE.—The returns for the settlement at the Gulf of Carpentaria were not procurable.

CRIME.

The undermentioned table shows the number of prisoners tried in each year from 1859 to 1865 inclusive, and how many were acquitted and found guilty:—

Year.	*Total.*	*Acquitted.*	*Convicted.*
1859	57	22	35
1860	41	11	30
1861	43	19	24
1862	55	32	23
1863	91	35	56
1864	94	33	61
1865	136	37	99

TRADE OF THE COLONY.

1865.

The subjoined return shows the imports and exports into and from every port in the colony during the year 1865—the latest official returns :—

Port.	*Imports.*	*Exports.*
Brisbane	£1,971,154	£718,193
Cleveland Bay	570	8,145
Port Denison	103,100	33,163
Port Curtis	19,278	46,215
Maryborough	84,797	73,226
Rockhampton	326,660	274,522
Total	£2,505,559	£1,553,464

EXPORT OF PRODUCTS.

Arrowroot	12,141 lbs.	Hides	45,511 in number.
Cotton	145,820 lbs.	Tallow	1940 tons 0 cwt. 2 qrs.
Copper Ore	4424 cwt. 1 qr.	Wool	12,251,841 lbs.
Gold Dust	25,338 ozs. 17 dwts. 16 grs.		

LIENS AND MORTGAGES, &c.

The liens on wool of the next clip registered during 1865 were 140 in number; the amount borrowed was £359,790 15s. 7d.; and the number of sheep of which the wool was pledged was 2,030,711.

The mortgages on live stock existing at the close of 1865 amounted to £4,714,764 18s. 3d., and the stock pledged as security was—sheep, 6,565,522; cattle, 753,314; and horses, 40,415. The total number of sheep in the colony was 6,810,005, of which not more than 244,483 were unmortgaged.

THE FRANCHISE.

According to the latest official returns published, the number of electors in each electorate (as the electorates were then constituted) was as follows :—

Brisbane (North)	2070	Ipswich	1474
Brisbane (South)	285	Leichhardt	No return
Burnett	311	Maranoa	160
Downs (Eastern)	387	Moreton (East)	1499
Downs (Western)	617	Moreton (West)	1677
Downs (Northern)	509	Port Curtis	1266
Drayton and Toowoomba	557	Warwick	263
Fortitude Valley	769	Wide Bay	651
Total number of electors			12,399.

*** Since this return was first published, six new electorates have been formed, viz.:—Clermont, Kennedy, Maryborough, Mitchell, Rockhampton, and Warrego.

All claims for enrolment upon the electoral roll for the district in which the voter may happen to reside must be forwarded to the Chief Clerk of Petty Sessions in each district on or before the 1st of February in each year. The form is as follows :—

29 VICTORIÆ, No. 12.—SCHEDULE A.

Notice of Claim to be given to Clerk of Petty Sessions.

TO THE CLERK OF PETTY SESSIONS IN THE ELECTORAL DISTRICT OF..........................

I hereby give you notice that I claim to have my name inserted in the Electoral

Roll for the Electoral District of.......................................my name, residence, and qualification being as hereunder stated :—

CHRISTIAN AND SURNAME.	RESIDENCE.	QUALIFICATION.	WHERE SITUATE OR HOW ARISING.

(Signed).......................................

Dated this..........................day of..........................18

The electoral qualifications are those laid down in the Constitution Act (N.S.W.) of 1855, and the following epitome—showing in what those qualifications consist—will demonstrate that the franchise is obtainable by almost every industrious man, within a few months after his arrival in the colony :—

Every man twenty-one years of age, who is either a natural born or naturalized subject of Her Majesty ; and who is either—

Owner of a freehold worth £100 above all charges and encumbrances, and which has been held in possession six months previous to the time of registration. [This latter proviso obtains also in connection with the qualifications arising from households, salary, and board and lodging.]

Occupier of a house or tenement of the annual value of £10 ;

Leaseholder to the annual value of £10, whose lease has not less than three years to run at the time of registration ;

Leaseholder to the amount aforesaid, three years of whose lease has expired previous to registration ;

Holder of a pastoral license from the Crown ;

Receiving a salary of £100 a year ; or

Paying £40 a year for board and lodging ; or £10 a year for lodging only.

QUEENSLAND TARIFF.

PARTICULARS.		RATES OF IMPORT DUTIES.	PARTICULARS.		RATES OF IMPORT DUTIES.
Imports—		s. d.	*Imports*—		s. d.
Brandy	per gal.	10 0	Vinegar	per gal.	0 6
Gin	,,	10 0	Tobacco	per lb.	2 6
Liqueurs, Cordials, or Strong Waters ...	,,	10 0	Snuff	,,	2 6
Whisky	,,	10 0	Cigars...	,,	4 0
Rum	,,	10 0	Opium	,,	20 0
Perfumed Spirits ...	,,	10 0	Tea	,,	0 6
All other Spirits ...	,,	10 0	Coffee and Chicory ...	,,	0 4
Wine	,,	6 0	Chocolate and manufactured Cocoa ...	,,	0 4
Ale, Porter, and Beer (in wood)	,,	0 3	Raw Cocoa...	,,	0 2
Ale, Porter, and Beer (in glass)	,,	0 6	Sugar, refined	per cwt.	6 8
Spruce and other Beer	,,	0 6	Sugar, raw...	,,	6 0
Cider and Perry... ...	,,	0 6	Molasses	,,	3 4
			Dried Fruits	per lb.	0 1
			Rice	per ton.	40 0
			Salt	,,	40 0

All other articles imported to pay an *ad valorem* duty of seven and a half per cent., with the usual exceptions.

GULF OF CARPENTARIA, &c.

During the past two years an immense extent of country on all the rivers flowing into the Gulf of Carpentaria has been taken up. On the Flinders, below Mr. Henning's, there are stations belonging to Messrs. Walker, Palmer, Seaward and Co., Alexander and Halloran, Brodie, Smith, Earl Brothers, Hetzer, and Anderson. Almost the entire frontage on both sides of the river to the coast is occupied. On the Leichhardt River the country is licensed to Messrs. J. G. Macdonald, Cassidy and Macdonald. To the westward, on the Albert and Gregory rivers, Messrs. Moorhead and Young, and Towns, Stuart, and Macdonald have extensive runs. On the Albert River, at the head of the navigation, a large area is reserved for the convenience of travelling stock, and to provide commonage in the event of a trade of live stock being established with India. On this river a settlement has already been formed and several stores established. The first store, belonging to Messrs. J. G. Macdonald and Co., was placed on the left bank of the Albert, within half a mile of the spot where the hull of the Firefly lies, and distant from Floraville station, Leichhardt Falls, in a direct north-east line, about thirty-five miles.

The following notes are by William Landsborough, Esq., the explorer, who holds the appointments of Police Magistrate and Commissioner for the Gulf country:—

"The shores of the Gulf of Carpentaria are very level for a considerable distance inland. Where the soil is rich, which is commonly the case, it is covered with a fine natural herbage, which has proved itself to be of a most excellent quality for stock of all kinds. Near the watercourses the land is sparsely wooded with stunted box and other trees; but between the watercourses, in many places, there are large plains totally destitute of timber.

"According to Captain Stokes, the best authority on the navigation of the northern coast, the general appearance of the head of the gulf is that of a low mangrove shore, between ten and thirty feet high, over which the interior is not visible from the offing. Twenty-six inlets within a distance of 200 miles were more or less examined by him. Three of these proved to be rivers, and three more were nearly as promising. Of the rivers Captain Stokes evidently regarded the Albert with the greatest favour; but it, like all the others, has a bar at its mouth, which has only eighteen inches of water at low tide. Unfortunately, the tide in the Albert only rises once in the twenty-four hours. The rise at spring tides is from nine to twelve feet; and at neap tides, from three to eight feet. At present the bar offers no great obstacle to vessels sufficiently large for the trade, nor will it for some little time to come, as they can get over it at high water, and afterwards can easily go up the river for thirteen miles to a point within five miles of which the river is often fresh, and where there are lagoons of fresh water within an easy distance of the stream.* Shipping ports may before long be established at other rivers besides the Albert. A port on the Flinders will probably obtain the largest share of the produce, from the fact that it will be the outlet to a greater

* The brig Firefly, which had a draught of between nine and ten feet, was taken about fourteen miles up the Albert River.

extent of back country—that is to say, as long as exports are confined to pastoral products. The Albert also has a very fine back country for pastoral purposes, but it is limited in extent, and to the westward it is very inferior; but, on the other hand, the Albert River is more easy of access, being only thirty-three miles distant from Investigator Roads.

"Investigator Roads is situated between Bentinck and Sweer's Islands. The former is a well-watered island, about thirty miles in circumference; the latter, however, although much smaller, is better adapted for settlement in the first instance, as it is not much frequented by blacks. When Captain Norman was cruising in the Victoria along the shores of Carpentaria, in the summer of 1861, in search of traces of Burke's party, he established a depôt on Sweer's Island, and another on the banks of the Albert. The climate was found to be healthy at both places. The heat of the season was found to be alleviated by an almost continual sea breeze. The people at the depôt at Sweer's Island were not much troubled with mosquitos, which, of all nuisances induced by warm weather, is perhaps the most annoying. As Investigator Roads presents the only good anchorage for large vessels along the shores of Carpentaria, the future city of the Gulf may be on either Sweer's or Bentinck Island.

"Messrs. Moorhead and Young led the way to, and took possession of, some country on the Albert River. Their stock was brought from the Mitchell district by the Upper Flinders; they thus established a road between the two places. The Upper Flinders had previously been settled upon, and was connected by a road with Port Denison.

"The next road was made by Messrs. J. G. Macdonald and Co., who led the way with stock from their stations near the head of the Burdekin to the Albert River; in doing so they made a plain road from the settled country to the north-west of Port Denison to the Albert River. This enterprising firm made another important step: they chartered a vessel in Sydney to take stores to the Albert River, which arrived safely at its destination, and has since been followed by regular traders.

"Stock are now depastured throughout the whole length of the Flinders, and on the Cloncurry, which is the western branch of that river. Stock are also depastured on the banks of the Leichhardt, and on the banks of the Landsborough, which is an eastern branch of the Leichhardt. The estuary of the Flinders is about seventy miles to the eastward of that of the Albert; and the estuary of the Leichhardt is between that of the Albert and that of the Flinders. The estuary of the Nicholson is a few miles to the westward of the Albert River. In short, the seaboard between Nicholson and Flinders, a distance of more than eighty miles, is already more or less occupied with stock."

Early in 1866 Mr. Landsborough entered upon his official avocations at the new settlement, which received many accessions to its population. Accounts which have reached us from thence, however, have shown that the experience of the residents did not bear out the favourable vaticinations which had been pronounced with reference to the healthiness of the locality. At one time the small population was nearly decimated by a disease which is now too well known as the "gulf fever," and few of the survivors escaped its attacks. In fact, Mr. Landsborough has gone so far as to recommend to the Government the abandonment of the present site of the settlement on the banks of the Albert, and the adoption of another at Sweer's Island. To that island Mr. Landsborough

found it necessary to remove his own establishment in the first place, and his example was followed by other residents. The Government have now laid out and proclaimed for sale a township on the island, and this, we presume, will be *the* business locality—notwithstanding its inconvenience of situation—until some more healthy site can be found for a settlement on the main land. With all the drawbacks, however, the Gulf settlement has not deteriorated to any extent as a place of business.

INTERCOLONIAL EXHIBITION, 1866-7.

STATISTICAL SKETCH OF SOUTH AUSTRALIA,

BY

JOSIAH BOOTHBY, Esq., Government Statist.

As published in the Adelaide Almanac and Guide to South Australia for 1867.

COMMISSIONERS FOR MELBOURNE:

Hon. ARTHUR BLYTH, M.L.A. | Hon. HENRY AYERS, M.L.C.

Representative—B. H. BABBAGE, Esq.

Secretary—S. H. DEERING, Esq.

SOUTH AUSTRALIA.

THE following gentlemen acted as a Committee for the collection, transmission, &c., of articles intended to be exhibited at the Paris Universal Exhibition of 1867, and the Intercolonial Exhibition of 1866-7:—

President—SIR D. DALY.

Vice-Presidents—HON. H. AYERS (also Executive Commissioner), HON. S. DAVENPORT, HON. J. HART.

Treasurer—MR. S. TOMKINSON.

Secretary—MR. S. DEERING.

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MR. A. B. MURRAY, M.P.
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HON. J. B. NEALES.

III. PASTORAL.

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MR. N. BLYTH.
MR. J. MELLOR.
MR. J. PEACOCK.
HON. T. REYNOLDS.

VI. MISCELLANEOUS.

HON. J. HART *(Convener).*
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MR. R. D. ROSS.
DR. SCHOMBURGH.
MR. H. H. TURTON.

STATISTICAL AND OTHER INFORMATION

RELATING TO

THE COLONY OF SOUTH AUSTRALIA.

STATISTICAL SKETCH OF SOUTH AUSTRALIA.

BY JOSIAH BOOTHBY, ESQ., GOVERNMENT STATIST.

The statistical sketch for the year 1865, comprised in the following paragraphs, affords the principal items of statistical information in a condensed form, and exhibits the progress of the province during another year. In connection with former issues, three in number, much valuable information is supplied, the greater portion originally prepared for these sketches, and may be regarded as a reliable record of the social and material advancement of the community from year to year.

POPULATION.

During 1865 there was a larger addition to the population than in any year since 1855, amounting to 9264 persons, giving a rate of increase during the year of six and a quarter per cent., as compared with five per cent. during 1864, and three and three-quarters in 1863.

The census, taken on the 26th March, 1866, showed the population of the colony to be 163,452 persons, of whom 85,334 were males and 78,118 females, showing an increase since the previous census, in 1861, of 36,622 persons, or 29 per cent. During the intervening period the annual returns of births and deaths and of immigration and emigration showed a gain of 30,904, whilst the census returns show a further increase of 5718 persons. The increase in the male population was thirty-one per cent., and of females twenty-six per cent.; the adult males increasing from 30,377 to 40,486, or one-third. The additional land cultivated amounted to fifty-four per cent., whilst the number of houses increased from 27,904 to 33,476, or by about one-fifth. The numbers of the people recorded at previous censuses were as follows:—In 1844, 17,366 persons; in 1850, 63,700 persons; in 1855, 85,189 persons; in 1861, 126,830 persons; and in 1866, 163,452 persons, or nearly double the number enumerated ten years ago.

BIRTHS, DEATHS, AND MARRIAGES.

Six thousand six hundred and seventy-two births were registered in 1865, or 464 more than during the previous year. The birth-rate was therefore forty-five per thousand persons, or one per thousand higher than in the preceding two years. Notwithstanding the augmentation of the population since 1861, the birth-rate is now 0·5 per thousand more than was recorded at that date. Of the total number of births, 3369 were males, and 3303 females, or 102 boys to 100 girls.

Fewer deaths were registered during 1865 than in either of the preceding

two years, the number being 2174, as compared with 2565 in 1864, and 2221 in 1863. Owing to the epidemic prevalent during 1864, the rate of mortality in that year, 18·2 in a thousand persons, was exceptional; it will therefore be necessary to compare the rate existing during 1865—14·8 per thousand, with that of the year 1863, 16·4—when it will be seen that the mortality last year was 1·6 per thousand below what may be taken to be the average rate of mortality in this colony. Many more males died than females, especially at the latter periods of life, the excess of the former being much greater than usually exists; out of 2174 deaths, only 954 were deaths of females; whilst in the previous year, in 2565 deaths, 1217 were females.

Fourteen hundred and thirty-six marriages were solemnised during 1865—many more than had been recorded in any previous year, and showing an increase of 145 over the number registered in 1864, and of 278 above those celebrated in 1861.

IMMIGRATION AND EMIGRATION.

The excess of immigration over emigration (by sea) was greater during the year under review than was recorded in either of the past ten years—the total addition to the population from this source amounting to 4766 persons, of whom 2649 were males and 2117 females. The number of immigrants introduced at the public expense, or partly so, was 4625, of whom 2692 were males and 1933 females. From these figures it would appear that 141 persons were gained to the community over and above the whole number of immigrants introduced by the State. Since the resumption of immigration in October, 1862, 9382 Government immigrants have arrived; during the like period the net addition to our population by the excess of arrivals over departures was 9935 souls—showing that the community has increased by 553 persons more than the whole number of Government immigrants landed on our shores.

PUBLIC WORSHIP.

Six additional places of worship appear to have been opened during 1865, affording, with extensions of present buildings, further accommodation for 4248 persons, making in all 461 churches and chapels, with seats for 83,843 persons. Besides which, 173 rooms were used for religious services—being a few less than last year, owing to the abandonment of several preaching stations during the drought in the Far North—making the aggregate number of places of worship used during 1865 to be 634, with accommodation sufficient for 90,350 persons, or three-fifths of the population. The following figures show the progress effected in this direction during the past three years:—

	1863.	1864.	1865.
Number of Churches or Chapels	431	455	461
,, Sittings in ditto	76,813	79,595	83,843
,, Rooms used, &c.	170	180	173
,, Sittings in ditto	7,065	7,621	6,507
Total Number of Places of Worship	601	635	634
,, ,, Sittings provided	83,878	87,216	90,350
Sunday Schools	360	382	384
,, Teachers	3,017	3,254	3,484
,, Scholars	21,799	23,087	23,739

Satisfactory advancement is also evidenced by the attendance at Sunday-schools, the large numbers recorded in past years not only being maintained, but a slight addition shown in the number of schools, teachers, and scholars.

EDUCATION.

Twelve additional schools were licensed by the Education Board during 1865, making a total of 279. The number of scholars on the roll was 13,680—7577 boys and 6103 girls—of whom about 79 per cent. were in attendance. From calculations based on the Census returns, it appears that the aggregate number of children receiving instruction is one in every 7·7 of the population. There were 62 district school-houses erected up to the close of the year, by voluntary subscriptions chiefly, supplemented by a grant from Government, amounting in the whole to £11,209. Thirty-nine country institutes were in active operation during the year.

CRIME.

The criminal records of the province exhibit an unusual number of offences committed in 1865, as compared with previous years, and especially so in felonious offences against the person and against property, in which classes the number of convictions in the preceding year had been smaller than in either of the previous ten years.

In the Supreme Court 134 prisoners were convicted out of 197 committed for trial, showing an increase of 93 commitments and 64 convictions. This sudden increase in crime is more strikingly apparent from the fact that of late years we have been singularly free, the commitments per thousand persons having gradually been reduced from 2·289 in 1859 to 1·308 in 1864, rising, however, in 1865 to 1·705. The average for that period was 1·729 in a thousand, or one commitment in 595 persons. When the rapid influx of population during the past two years is taken into account, and also that some accessions have not been from a desirable class, it is satisfactory than otherwise to find that the commitments in 1865 did not exceed the average number.

The proportion of offenders convicted before a jury has increased from five in every ten to seven in every ten persons placed on their trial.

It need hardly be said that the amount of crime thus shown to exist in South Australia is below that exhibited in the returns of the mother country, and far beneath that prevailing in the neighbouring colonies.

Again, if comparison be instituted in like manner with regard to the nature of the crimes perpetrated, it will be seen that this province has been remarkable for the absence of crimes of a serious nature. During the past ten years, out of 820 prisoners tried in the Supreme Court, only 95 were for offences against the person, or less than ten per annum; whilst in the same period it was necessary to carry the extreme penalty of the law into effect in but two instances.

REVENUE AND EXPENDITURE.

The revenue returns for the year 1865 exhibit a remarkable increase in all sources of income, but more especially in the Land Fund receipts. The total revenue for the twelve months amounted to £1,089,189, as compared

with £775,837 in 1864—an addition of £313,291, or 42 per cent. The great demand for land and the high price paid swelled the amount of the land sales to the large sum of £504,677, or an increase of £256,672, or nearly twice the sum received in the previous year. The Customs revenue was also greater than had been collected in any preceding year. This, the only source of taxation, produced £240,183, or one-fifth more than last year, being at the rate of thirty shillings per head of the population—a lower rate than is imposed upon any other Australian community.

The following is a statement of the revenue during the years 1864 and 1865:—

Revenue.	1864.			1865.		
	£	s.	d.	£	s.	d.
Sales of Crown Lands	256,672	18	0	504,677	1	10
Customs	203,349	14	[illegible]	240,183	12	3
Port and Harbour Dues	5,272	11	5	6,277	14	8
Rents (exclusive of Land)	1,136	5	0	1,629	3	4
Land Revenue	48,361	5	4	73,891	11	0
Assessments	27,739	10	1	5,107	15	9
Licenses	15,718	8	6	16,302	4	0
Postage	22,001	6	4	25,023	2	5
Fines, Forfeitures, and Fees	19,622	19	2	20,461	4	3
Sales of Government Property	4,609	13	11	681	10	8
Reimbursements	4,641	1	11	10,546	7	5
Miscellaneous Receipts	2,440	5	9	2,125	0	10
Interest, Exchange, &c.	2,340	10	2	7,145	2	1
Special Receipts	6,312	18	5	9,298	13	7
Railways	118,307	3	1	134,070	12	0
Port Elliot and Goolwa Tramway	2,209	12	9	3,355	0	10
Telegraphs	10,567	2	1	11,126	0	7
Water Rates, Adelaide	15,342	12	5	17,226	16	10
Northern Territory	9,191	15	6	—		
Total Revenue	£775,837	1	4	£1,089,128	14	4

The total expenditure of the Government amounted to £790,504, or £163,815 more than in 1864, as detailed below. The amount expended on public works out of the general revenue was £223,083, in addition to £18,654 out of the Loan Fund, which, together with a sum of £93,056, set apart for the payment of interest on and redemption of loans for public works, makes a total disbursement on account of permanent improvements of £334,793, as compared with £248,004 in 1864. The immigration expenditure was £53,688, as against £36,850 in the previous year.

Expenditure.	1864.			1865.		
	£	s.	d.	£	s.	d.
Civil List	14,800	0	0	14,800	0	0
Establishments—						
Salaries, Fixed	75,161	1	0	81,356	13	4
Ditto, Provisional and Temporary	84,468	8	0	102,594	14	10
Allowances	3,832	17	4	4,627	18	8
Contingencies	143,567	3	10	177,811	10	0
Pensions, Retired Allowances, &c.	2,609	8	4	4,319	7	11
Works and Buildings, Roads, Streets, and Bridges	136,674	19	11	223,083	1	10
Miscellaneous Services	35,702	4	3	34,421	14	0
Interest on and Redemption of Loans	92,643	0	0	93,056	0	0
Interest, Exchange, &c.	379	1	5	744	11	0
Immigration	36,850	5	1	53,688	16	5
Total Expenditure	£626,688	9	2	£790,504	8	0

The public account showed a surplus of receipts over payments of £298,624 6s. 4d., or more than one-fourth of the total amount of the year's revenue, augmenting the balance in hands of the treasurer, which stood at £219,015 17s. 5d. on the 1st January, to £517,640 3s. 9d. at the close of the year.

LOANS FOR PUBLIC WORKS.

Bonds to the amount of £43,100 have been redeemed during the year, leaving the sum of £796,200 outstanding on 31st December, 1865. The rate per head of the population at that date was £5 1s. 8d., or nearly two-thirds less than the rate of indebtedness existing in the adjoining colonies, as will be seen from the following figures made up to the 30th June last, giving the debt of each Australian colony and the amount of Customs revenue, with the rate per head of the respective populations at that date:—New South Wales owed £13 8s., with a Customs revenue of 40s. per head; Victoria, £13 16s., with Customs duties amounting to 32s. per head; Queensland owed £31 15s. per head, with 76s. per head of Customs revenue; whilst South Australia owes but £4 10s. per head, and is only taxed at the rate of thirty shillings for each individual of the population.

BANKING.

The following are the aggregate returns of the five banks carrying on business in Adelaide, during 1865, for the three half-years ending 31st December, 1863, 1864, and 1865, respectively, omitting shillings and pence:—

Liabilities.	1863.	1864.	1865.
	£	£	£
Notes in Circulation	232,481	315,126	340,512
Bills in Circulation	7,882	12,700	12,138
Balances due to other Banks	24,904	11,715	26,415
Deposits	787,104	1,158,931	1,568,151
Total Average Liabilities	£1,052,322	£1,498,473	£1,947,217
Assets.	**1863.**	**1864.**	**1865.**
	£	£	£
Coin and Bullion	326,875	411,710	415,996
Government Securities	4,600	4,600	4,600
Landed Property and Bank Premises	55,185	60,868	69,257
Notes and Bills of other Banks	7,170	8,169	13,325
Balances due from other Banks	82,561	151,313	73,600
Notes and Bills discounted, and other Debts due to Banks not enumerated	1,603,564	1,724,760	2,424,924
Total Average Assets	£2,079,957	£2,361,300	£3,031,705

The Bank of Adelaide was opened in December, but was not required to make a return; the above statement, therefore, of the business transacted during the six months ending 31st December, 1865, applies only to those in operation during the whole of that year.

SAVINGS BANK.

Of late years the extension of the business of this bank has been most remarkable. Since 1861 the new accounts opened during twelve months, and the yearly increase in depositors, have more than doubled; the balance to credit of depositors has increased one hundred per cent.; the reserve fund has increased fifty per cent.; and the total assets of the bank are now twice the amount they were five years ago.

The following is a statement of the affairs of the bank during the past three years:—

	1863.	1864.	1865.
New Accounts Opened	1,440	1,806	2,333
Increase in Depositors	834	1,132	1,233
Amount Deposited	£91,783	£120,924	£113,115
,, Withdrawn	63,393	87,731	115,751
,, Depositors' Balances	189,143	231,972	258,693
,, Reserve Funds	12,062	13,431	15,378
,, Total Funds	201,205	245,403	274,071

Amount Lent on Mortgage, £181,895.

The funds of the depositors are secured by loans on mortgage of freehold property, bearing interest at 7½ per cent., amounting to £181,895 by bank deposits and by Government securities; the profits allowing of a rate of interest of five per cent. per annum, which has been the rate paid to depositors for several years.

IMPORTS AND EXPORTS.

Compared with the trade of 1864, when the external commerce of the colony increased nearly one-third in a single year, the operations of 1865 show but a slight advance—namely, six per cent. only; it is, however, important to note that so great an extension of business has been more than maintained during the past year. The combined import and export trade of 1865 amounted to over *six* millions sterling, being just double what it was ten years ago. The total imports in 1865 amounted to £2,927,596, and the exports to £3,129,846; together, £6,057,442—as compared with total imports in 1864 of £2,412,931, and exports of £3,305,545; together, £5,718,476—showing an increase of £338,966 in the trade of the year, or six per cent., as above stated. Compared with the year before last the increase in business would amount to thirty-eight per cent.

In 1865 we consumed in the colony imported goods equal to £16 6s. per head for each individual of the community (the rate in the previous year being £14 8s. per head), all but a fraction being the manufacture or productions of the mother-country and her possessions.

Nine-tenths of our exports are the staple productions of the country, but it is still satisfactory to notice an increasing intercolonial trade in articles of foreign manufacture—the value of the imports re-exported amounting to £375,189, as compared with £290,008 in 1864, showing an addition of £85,181, or thirty per cent. in this branch of our export trade.

Following are tables showing the imports from and exports to the several countries during the past five years:—

IMPORTS.

—	1861.	1862.	1863.	1864.	1865.
From	£	£	£	£	£
Great Britain	1,104,252	1,178,963	1,177,706	1,217,568	1,741,690
New South Wales	206,819	129,798	146,583	212,517	239,821
Victoria	366,008	198,274	441,927	697,075	620,301
Tasmania	20,599	23,631	19,234	21,877	36,439
Western Australia	4,249	5,608	7,242	2,472	11,961
East Indies and China	9,105	25,757	20,488	1,362	7,974
Mauritius	140,447	124,974	116,566	131,733	99,712
Other British Possessions	6,058	13,506	16,012	7,215	18,126
Foreign States	118,481	120,145	82,520	121,108	151,571
Total	1,976,018	1,820,656	2,028,279	2,412,931	2,927,596
Imports Re-exported	183,672	225,309	263,461	290,008	375,189
Retained for home consumption	1,782,346	1,595,347	1,764,818	2,122,923	2,552,407

EXPORTS.

—	1861.	1862.	1863.	1864.	1865.
To	£	£	£	£	£
Great Britain	821,869	943,607	935,880	918,523	964,894
New South Wales	252,713	323,994	337,478	623,127	557,685
Victoria	825,795	556,422	558,001	1,254,654	1,244,643
Tasmania	3,753	2,344	2,640	5,226	10,641
Western Australia	19,742	13,178	18,034	12,221	28,490
East Indies and China	40,516	148,400	208,000	132,783	77,155
Mauritius	32,766	40,663	27,664	21,364	3,571
Other British Possessions	35,157	113,580	266,147	275,792	242,244
Foreign States	—	3,638	4,973	52,855	522
Total	2,032,311	2,145,796	2,358,817	3,305,545	3,129,846
Imports Re-exported	183,672	225,309	263,461	290,008	375,189
Produce of Colony	1,838,639	1,920,487	2,095,356	3,015,537	2,754,657

The accompanying returns give the principal articles imported and exported during the last four years:—

IMPORTS—CHIEF ARTICLES.

—		1865.	1864.	1863.	1862.
Apparel and Slops	value £	11,749	9,348	22,248	34,349
Bags and Sacks—Cornbags	bales	5,850	4,694	3,585	1,898
Woolpacks	bales	1,737	1,096	963	498
Orebags	bales	216	33	76	116
Beer, Porter, Ale, Cider, and Perry	gallons	437,048	314,497	311,641	297,845
Boots and Shoes	value £	120,464	67,885	75,554	73,161
Candles	lbs.	549,668	568,669	594,065	326,985
Chicory	lbs.	81,200	90,292	43,120	53,872
Coals, Coke, and Other Fuel	tons	57,980	62,301	37,741	38,044
Coffee	lbs.	723,596	397,247	594,868	278,902
Cordage and Rope	cwts.	5,018	2,971	4,076	3,914
Cutlery and Hardware	value £	67,487	35,651	33,999	46,616
Drapery	value £	729,541	510,558	443,047	473,494
Earthenware and China	value £	14,530	11,315	12,142	15,292
Fruit (Dried)	cwts.	7.469	10,175	12,328	10,413
Groceries and Oilmen's Stores	value £	47,304	46,004	47,362	30,543
Gunpowder	lbs.	222,628	131,398	113,191	108,215
Hops	lbs.	219,116	120,413	216,639	118,185

IMPORTS—*continued.*

—		1865.	1864.	1863.	1862.
Iron—Bar and Rod	tons	3,324	1,440	924	1,690
Sheet and Hoop	tons	596	405	358	205
Pig	tons	757	128	406	814
Manufactures	value £	177,440	114,120	83,273	80,242
Implements and Tools	value £	38,984	13,421	12,291	23,109
Jewellery, Plate, and Plated Goods	value £	21,870	18,575	11,560	12,159
Oil—Sperm and other Fish Oils	gallons	19,635	13,458	9,061	9,492
Linseed, Rape, Hemp, &c.	gallons	847	2,755	967	2,620
Mineral and other Oils	gallons	152,400	59,560	34,988	60,307
Potatoes	tons	4,959	3,308	2,942	686
Rice	tons	400	243	264	114
Saddlery and Harness	value £	39,918	18,164	15,600	20,223
Salt	tons	1,086	887	1,242	1,827
Soap	tons	253	143	106	196
Spices	cwts.	638	491	725	566
Spirits—Brandy	gallons	65,616	71,318	73,973	41,497
Rum	gallons	33,534	34,635	39,155	51,296
Gin	gallons	34,563	24,259	41,882	24,083
Whisky	gallons	9,381	17,990	23,866	7,632
Geneva	gallons	9,676	6,757	7,963	3,990
Sugar	cwts.	88,938	97,159	98,072	89,216
Tea	lbs.	1,332,431	1,169,505	906,458	1,025,349
Tobacco	lbs.	356,341	554,384	242,879	176,703
Cigars	lbs.	40,321	20,967	17,546	23,751
Wine	gallons	48,575	65,863	54,411	35,394
Wood—Palings	number	1,320,231	1,338,638	1,078,362	1,163,218
Shingles and Laths	number	1,622,300	486,300	622,200	227,000
Sawn, Hewn, &c.	loads	37,735	22,870	13,623	14,089

EXPORTS—CHIEF ARTICLES.

—		1865.	1864.	1863.	1862.
*Animals—Horses	number	560	643	911	536
Sheep	number	1,214	1,812	832	6,369
*Bacon and Hams	cwts.	45	132	471	464
*Bark	tons	2,526	1,074	993	567
*Bones	tons	57	102	73	123
Beef and Pork	cwts.	300	628	—	1,269
Beer	gallons	29,813	42,425	28,390	21,344
*Butter and Cheese	cwts.	555	1,043	1,950	3,724
*Corn—Flour	tons	38,251	41,818	39,722	35,604
Barley	bushels	3,296	27,336	28,312	19,072
Bran and Pollard	tons	4,819	8,209	7,381	6,700
Wheat	bushels	1,001,768	1,563,080	932,272	696,960
Cutlery and Hardware	value £	2,890	2,227	1,566	4,582
Drapery	value £	30,492	17,493	19,103	26,084
*Eggs	value £	3,867	6,059	5,769	5,985
*Fruit—Fresh	value £	4,495	4,681	4,605	8,768
Dried	cwt.	554	1,127	1,586	690
*Glue Pieces	value £	220	350	297	878
Groceries	value £	17,437	12,726	10,166	7,845
*Gum	cwt.	2,464	1,718	1,901	1,628
*Hay	tons	730	3,795	2,876	2,119
*Hides and Skins	value £	3,997	5,127	6,684	1,769
*Implements	value £	510	307	540	1,345
*Jam	value £	8,598	8,752	3,795	—
*Leather	cwts.	2,692	2,035	1,560	2,297
*Metal—Copper	cwts.	100,196	134,055	96,039	85,872
Lead	cwts.	82	63	336	426
*Onions	cwts.	55	929	565	870
*Ore—Copper	tons	16,176	4,532	5,343	6,216
Regulus	tons	12	567	39	418
Lead	tons	75	52	450	97

EXPORTS—*continued.*

—		1865.	1864.	1863.	1862.
Bismuth	tons	—	13	—	—
*Rags	value £	146	52	188	326
Sugar	cwts.	10,414	7,056	6,881	8,803
*Tallow	cwts.	16	549	35	504
Tea	lbs.	123,982	414,012	80,153	90,916
Tobacco	lbs.	116,077	86,864	33,980	66,877
Cigars	lbs.	3,548	6,270	2,544	3,598
*Wool	lbs.	18,945,425	17,496,551	16,568,779	14,407,244
Wine—*South Australian	gallons	23,481	20,674	27,705	20,574
Foreign	gallons	1,810	4,759	3,580	2,560
Spirits—Brandy	gallons	10,967	5,935	3,581	8,532
Genova	gallons	1,884	2,108	1,923	857
Gin	gallons	2,145	738	897	1,003
Rum	gallons	3,309	6,173	3,825	1,437
Whisky	gallons	2,085	2,315	1,394	2,207

(Marked *, chiefly Colonial Produce.)

EXPORTS OF PRODUCE OF THE COLONY.

In continuation of similar tables supplied in former issues, statements are appended exhibiting the progress of the chief elements of prosperity over an extended period, thereby obtaining a more correct insight into their present position, as compared with their progress during past years. The aggregate exports of South Australian produce for the past decade amounted to nineteen millions sterling, of which seven and a half millions belong to the first division, and eleven millions and a half to the second division of the period—or an augmentation of four millions in the value of five years' shipments. In 1856, the total exports amounted to £1,398,367; in 1860 they were valued at £1,576,326; but in 1865 they reached £2,754,657 sterling. The average annual exports of the quinquennial period ending 1860 were £1,515,216; the average for the next period ending 1865 being £2,324,935. The following table gives the amount contributed by each class of producers to the total exports of colonial produce:—

Period.	Total Exports of Produce.	Of which Exports.			
		Breadstuffs, Grain, &c.	Wool.	Copper and other Minerals.	Miscellaneous Products.
In the Year:	£	£	£	£	£
1856	1,398,367	556,371	412,163	408,042	21,791
1865	2,754,657	1,228,480	821,482	620,112	84,583
Total in Five Years:					
1856-60	7,576,083	2,890,976	2,395,861	2,097,718	191,528
1861-65	11,624,676	4,786,219	3,571,350	2,853,920	413,187
Average of Five Years:					
1856-60	1,515,216	578,195	479,172	419,543	38,305
1861-65	2,324,935	957,244	714,270	570,784	82,637

BREADSTUFFS, GRAIN, ETC.

Following upon the prolific harvest of 1863-4, which produced 4,691,919 bushels of wheat, and enabled us to export 76,552 tons of breadstuffs, the shipments of flour and wheat during 1865 show a considerable falling off in quantity, the harvest having produced 4,252,949 bushels only, and the exports being 60,513 tons, or 16,039 less than in

the preceding year. Owing, however, to the very large demand in the adjoining colonies, from a second failure in their crops, and the uniformly higher rates at which the price of wheat was maintained in 1864, the value of the shipments was brought to £1,228,480, or within £236,113 of the previous year. In 1864 the average price of wheat was 8s. 6d. per bushel, and of flour £20 9s. per ton; in 1865 the former averaged 8s. 7d. per bushel, and the latter £20 10s. per ton. But whilst in the former year the season opened with wheat at 4s. 3d. per bushel, and for the first quarter averaged only 5s. 1d. per bushel, and the price fluctuating throughout the year from 4s. 3d. to 10s. 9d., the season of 1865 opened at 8s. per bushel, and was steadily maintained throughout the year, never falling below 7s. 8d., or rising above 9s. The whole benefit of the enhanced value of our cereal produce was thus obtained, and the deficiency in the crop nearly made up. The quantity of breadstuffs shipped in 1865 was within a few tons the same as in the year 1863, namely 60,000 tons; it was worth, however, two-thirds more money.

The subjoined table exhibits the places to which breadstuffs were exported during the last three years, and the quantities:—

EXPORTS OF BREADSTUFFS.

Countries to which exported.	Flour			Wheat.		
	1863.	1864.	1865.	1863.	1864.	1865.
	Tons.	Tons.	Tons.	Qrs.	Qrs.	Qrs.
Great Britain	171	$\frac{1}{2}$	...	190	$\frac{1}{4}$	1
Victoria	9,392	16,537	15,537	25,061	104,148	68,410
New South Wales	13,772	16,532	14,322	47,378	63,136	35,040
Western Australia	529	138	156	18	11	1
Tasmania	...	50	60	1,625	1,083	2,841
New Zealand	8,075	4,722	3,875	16,651	21,969	17,234
Cape Town	3,655	120	...	21,061	1,885	...
Mauritius	1,144	372	90	4,555	1,720	...
Indian and Chinese Ports	255	865	70	...	1,411	1,694
Brazil	354	...	...	...	...	...
Queensland	2,375	3,481	4,141	...	24	...
Totals	39,722	41,818	38,251	116,534	195,385	125,221

The following information respecting the acreage of the past five wheat crops—the produce, the average yield, the average price, and the rate of labour ruling—will be found useful:—

WHEAT.

Season.	Acres.	Produce.	Per Acre. Average.	Average Price.	Average Labour.
		Bush.	Bsh. Lbs.	Bush.	Per Day.
1861-2	310,636	3,410,756	10 59	5s. 8d.	6s. 0d.
1862-3	320,160	3,841,824	12 0	4s. 8d.	6s. 0d.
1863-4	335,758	4,691,919	14 0	4s. 10d.	6s. 0d.
1864-5	390,836	4,252,949	11 0	7s. 10d.	6s. 6d.
1865-6	410,608	3,587,800	8 44	8s. 7d.	6s. 6d.

The following table gives the quantities shipped and the yearly average prices of wheat and flour since 1861:—

Shipments Breadstuffs.* Tons.	Year.	PRICES.		EXPORTS.	
		Wheat. Per Bush.	Flour. Per Ton.	Wheat. Bushels.	Flour. Tons.
47,902	1861	5s. 8d.	£14 0s.	674,160	33,011
51,092	1862	4s. 8d.	£11 14s.	696,960	35,604
60,434	1863	4s. 10d.	£12 0s.	932,272	39,722
76,553	1864	7s. 10d.	£20 9s.	1,563,080	41,818
60,513	1865	8s. 7d.	£20 10s.	1,001,768	38,251

* Calculating 45 bushels wheat to a ton of flour (2000 lbs.).

The weights of the Agricultural Show Prize Wheat, per imperial bushel, during the past five years, have been as follow:—

Show.	HILLS.		PLAINS.	
	lbs. ozs.	Grower.	lbs. ozs.	Grower.
1862	68 6	A. Bell	66 2	J. Craig
1863	68 1	J. Frame	67 15	T. Reid
1864	68 11	J. Hay	68 4	M. Rankine
1865	68 13½	J. Waddell	67 0	W. & J. Venning
1866	68 8	J. Waddell	68 5	G. Venning & Sons

The prices of wheat and flour in each month, October, 1863, to September, 1866, three years, have been as follow:—

Month of Year ending Sept.	WHEAT. Year ending September.			FLOUR. Year ending September.		
	1864.	1865.	1866.	1864.	1865.	1866.
	Bushel.	Bushel.	Bushel.	Ton.	Ton.	Ton.
October......	5s. 7d.	10s. 0d.	8s. 8d.	£13 7s. 6d.	£24 10s.	£20 0s.
November..	5s. 2d.	8s. 6d.	11s. 9d.	£12 10s. 0d.	£22 10s.	£28 10s.
December..	5s. 2d.	7s. 3d.	8s. 10d.	£12 10s. 0d.	£18 5s.	£21 5s.
January.....	4s. 3d.	8s. 0d.	8s. 2d.	£11 10s. 0d.	£20 10s.	£20 5s.
February...	4s. 9d.	7s. 9d.	7s. 4d.	£13 12s. 6d.	£20 0s.	£18 0s.
March........	6s. 3d.	9s. 0d.	7s. 4d.	£16 5s. 0d.	£22 0s.	£18 0s.
April..........	7s. 3d.	8s. 3d.	6s. 7d.	£21 0s. 0d.	£19 10s.	£17 0s.
May	7s. 6d.	8s. 0d.	6s. 3d.	£22 10s. 0d.	£19 0s.	£15 15s.
June..........	10s. 9d.	7s. 8d.	7s. 0d.	£27 0s. 0d.	£18 10s.	£16 10s.
July	10s. 6d.	8s. 4½d.	6s. 8d.	£26 0s. 0d.	£19 0s.	£15 10s.
August	8s. 6d.	8s. 10d.	5s. 6d.	£22 10s. 0d.	£20 0s.	£14 5s.
September.	8s. 3d.	8s. 0d.	5s. 2d.	£20 0s. 0d.	£18 12s. 6d.	£13 0s.

WOOL.

During 1865, the number of bales of wool shipped was 56,182, showing an increase of 5236 bales on the previous year's shipments; the total weight being 18,945,426 lbs., as compared with 17,496,551 lbs. in 1864, and 16,568,979 lbs. in 1863. The declared value amounted to £974,397, as against £848,125 and £776,545 in the two preceding years respectively; this increase is, however, occasioned by the larger quantity of Murray-borne and Western Australian wool transhipped at Port Adelaide, the

export of South Australian wool being only 177,795 lbs. greater than in 1864. The following table shows the exports during each of the three past years ending on the 31st December:—

From	1863.	1864.	1865.
	lbs.	lbs.	lbs.
Port Adelaide	7,321,137	8,472,298	9,734,297
Port Wakefield	2,799,000	1,774,300	1,908,678
Port Robe	1,218,400	2,077,300	1,892,460
Port Augusta	4,128,641	2,290,403	998,315
Port Macdonnell	39,309	771,656	1,217,013
Port Wallaroo	60,300	—	137,007
Port Elliott or Victor	—	6,138	382,120
Total Export S.A. wool	15,566,787	16,092,095	16,269,890
Produce of other colonies	1,002,192	1,404,456	2,675,535
Total shipments—lbs.	16,568,979	17,496,551	18,945,425
Bales—No.	48,226	50,946	56,182
Value South Australian wool	£715,935	£775,656	£821,482
Value of other wool	£60,610	£73,469	£152,915
Total value	£776,545	£849,125	£974,397

It has been suggested that as the wool season is at its height in December and January, the export returns made up to the close of the year do not show the actual weight of any given clip, and that such information is not to be obtained except with much trouble. I have therefore prepared the following table showing the desired particulars for the last three clips. The figures given are for the years ending 30th June, respectively, a period comprising as nearly as possible the aggregate weight of the season's clip:—

Year ended 30th June.	1864.	1865.	1866.
	lbs.	lbs.	lbs.
Port Adelaide	10,112,815	10,381,539	9,277,556
Port Wakefield	—	1,833,800	2,981,078
Port Robe	1,816,300	1,760,400	1,736,460
Port Macdonnell	541,380	1,014,850	800,790
Port Wallaroo	65,000	—	77,507
Port Augusta	4,294,400	2,206,325	998,315
Port Victor or Port Elliott	6,138	294,000	179,800
Port Caroline	—	—	72,383
Total weight (lbs.) S.A. clips	16,836,033	17,490,914	16,123,889

Comparing the above with the table previously given, it will be admitted that a more correct view of the position of the pastoral interest as regards the annual production of wool is thus presented than has formerly been the case. The disastrous effects of the prolonged drought in the North are apparent in the falling off in the shipments from Port Augusta. That district contributed to the clip shipped during the twelve months ended 30th June, 1864, 4,294,400 lbs., or one-fourth of the whole; in 1864-5 it fell to 2,206,325 lbs., or one-eighth of the whole; but in 1865-6 only

998,315 lbs. were shipped, or but one-sixteenth of the total exports. Again, the shipments from Ports Adelaide and Wakefield combined show no increase during the past season, in both years being about 12,000,000 lbs. weight, and there is a slight decrease in the exports from the South-Eastern District.

MINERAL PRODUCE.

During the past decade our mines have produced nearly five millions sterling, of which three millions nearly have been raised during the past five years. In 1856 the shipments were valued at £408,042, from which year up to 1860, when we sent away minerals of the value of £446,537, the average shipments amounted to £419,523 per annum. Since 1860 the exports have steadily increased, showing an average export of £570,784 yearly. The production of fine copper has increased from 44,980 cwts. in 1856, to 100,196 cwts. in 1865 (in 1864, 134,055 cwts. were exported). The shipments of fine copper in 1865 were 100 tons a week, as against 130 tons the year before. A fourfold quantity of crude ore, was, however, sent away, namely, 16,176 tons, as compared with 4545 tons. The average yearly shipments of fine copper, during the five years preceding the discoveries in the Wallaroo mineral district, amounted to 54,368 cwts. Since that date they have *averaged* 95,422 cwts., an increase of eighty per cent., whilst the average export of copper ore has also been maintained.

The following table shows the quantities and values of the different minerals shipped during the past five years :—

		1861.	1862.	1863.	1864.	1865.
Fine copper	Cwts.	61,047	85,872	96,039	134,055	100,196
	£	294,572	400,591	447,944	637,791	433,795
Copper ore	Tons.	7,817	6,216	5,343	4,545	16,176
	£	133,749	124,263	83,262	38,125	184,677
Lead	Cwts.	1,256	426	271	63	82
	£	4,426	981	525	121	133
Lead ore	Tons.	15	97	450	567	86
	£	300	2,266	9,007	13,107	1,507
Regulus	Tons.	390	418	39	52	—
	£	19,125	19,518	1,655	2,480	—
Total value	£	452,172	547,169	542,393	691,624	620,112

The requirements of the smelting works have necessitated a vast increase in the importation of coal, the imports now reaching 57,980 tons per annum, as compared with 19,980 tons in 1860, and 13,573 tons in 1856, employing a large amount of shipping.

LAND AND CULTIVATION.

During the year 1865 no less than 316,476 acres of country and suburban land were alienated from the Crown—or 91,305 acres more than were disposed of during the preceding twelve months—making the total area of purchased land in occupation on the 31st December last to be 3,210,290 acres, or 20·5 acres for each individual of the estimated population at that date, as compared with 2,893,814 acres on the 1st January

preceding, when the average was 19·64 acres, or 0·64 acres more than at the commencement of 1864.

Seventy-two thousand seven hundred and ninety-four acres additional land were brought under cultivation during the past season, an increase more than twice as great as that of the preceding one. In the three counties of Gawler, Light, and Stanley alone, the additional quantity of tilled land was 55,896 acres, and an increase of one-fourth is shown in county Grey, which has now 21,420 acres under the plough. The total area under cultivation is 660,569 acres, as compared with 587,775 acres in 1864-5—showing an augmentation amounting to twelve and one-half per cent., whilst the increase during the previous year was only five and three-quarters per cent. In my last report I stated that twenty per cent., or one in every five acres of purchased land, was under cultivation, as was the case in 1863, and that notwithstanding the large purchases of land for grazing purposes, the ratio of cultivated to untilled land continued as one to four. I am unable to show that, unprecedented as were the land sales of 1865—316,476 acres having been disposed of by the Crown—the above proportions have not only been maintained, but have become slightly more favourable. Four acres of tilled land continue to be the rate per head for each individual of the population, or twelve acres for every male of fourteen years of age and upwards.

The total area under wheat was 410,608 acres, against 390,836 acres last season, an increase of five per cent. only, or one per cent. less than in 1864-5. In the latter year two-thirds of the total land in cultivation were under wheat. This season the proportion is slightly under that, being only sixty-two per cent. Two and a-half acres of wheat are grown to each person in the community. The aggregate produce of the harvest amounted to 3,587,800 bushels, or 665,149 bushels below that of 1864-5, the average yield per acre being, so far as I am aware, less than in any preceding season, only amounting to 8 bushels 44 lbs. per acre. During the previous seven years the lowest yield recorded was 9 bushels 38 lbs. (in 1859-60), whilst the average for the whole period was 12 bushels, or 3 bushels 16 lbs. above that of 1865-6. The extent of land upon which hay was cut was increased from 66,570 acres to 101,996 acres—more than one-half; but as the crop only yielded 17 cwt. to the acre, or nearly one-fourth less than in 1864-5, the gross produce only resulted in an additional yield of 12,075 tons, being 88,731 tons in place of 76,656 tons. In 1863-4 the yield per acre was 27 cwt., and the total quantity secured 102,293 tons, off 75,590 acres—a fair average crop. It will thus be seen how serious a deficiency has existed during the two past years in the supply of this article of fodder.

Fewer acres of barley and oats were sown, and the yield was poorer than in the previous unfavourable season.

PASTORAL OCCUPATION.

Compared with last year there is an additional number of horses—73,993 as against 62,899, or an increase of 11,094—partly accounted for by the live stock in towns being returned on the census papers this year, a remark applying also to the following items, viz.—goats, which have increased from 9474 to 12,283; pigs, from 53,430 to 55,742; and poultry, from 327,881 to 377,001—a not inconsiderable or unimportant augmentation.

The live stock statistics, however, exhibit but too clearly the losses which the pastoral interest and the country have sustained through the long continuance of drought. Nine years ago we despastured twice the number of cattle that we now do—310,460 head as against 158,057. Then we counted *three* head of cattle for each individual of the population, now but *one*. During the past year their number has been reduced from 204,892 to 158,057, or by 46,835 head. Within the country boundaries there is a decrease of 10,978, whilst in the pastoral districts they have diminished from 62,527 to 26,670, or by 35,857 head.

The aggregate number of sheep returned is 3,779,308, as against 4,106,230, or a decrease of 326,922, or nearly nine per cent. less, as compared with an increase last year of five and a-half per cent., the increase in 1864 having been thirteen and a-half per cent. Comparing the returns for the year 1864, which were complete, with those for the past season, we find in the Northern District (viz., the country north of Port Augusta) that where in the former year 455,085 sheep were depastured, there are now only 133,199, or 324,886 less. The whole number at present within the pastoral districts is 970,812, as compared with 1,314,026 in 1864, or a decrease of 343,214.

RAILWAYS.

The traffic returns show a large increase in the number of passengers travelling over the lines, but a falling off in the goods receipts, owing to the diminished quantity of wheat and flour for transport, on which the traffic on the North Line chiefly depends. In other respects the revenue from the carriage of merchandise showed an improvement over the preceding year.

The total number of passengers conveyed on both lines was 402,550, as against 359,035 in 1864, and the total goods traffic 261,183 tons, as compared with 255,928 tons in the previous year.

The aggregate receipts amounted to £133,280, as against £129,246, the increase in the sum received from passengers and sundries being £4865, and the deficiency from goods £831, showing a net increase of £4034, as compared with an increase of £31,990 in the previous year. It must be borne in mind, however, that the returns for 1864 were remarkably favourable, owing to the abundant harvest of that year. It is therefore satisfactory to find that the extension of the passenger traffic has been so large, and that the diminution in the goods branch is not greater. In comparison with the receipts for 1863 there is an increase of £11,228 in the passenger receipts, and of £24,382 in the goods traffic, which, together with an addition of £414 in the miscellaneous receipts, shows a total increase of £36,024, extending over a period of two years.

TELEGRAPHS.

The year 1865 completed the first decade since the introduction of the telegraph into South Australia, during which period lines have been opened connecting forty-five of the principal townships within the colony, and establishing instantaneous communication with all the more important cities, ports, and towns throughout the whole continent of Australia, now linked together by a chain of telegraph wire 8500 miles in length. Within this colony 855 miles of telegraph have been opened, the length of wire

erected amounting to 1173 miles. During 1865 four new stations were opened. The number of messages transmitted was 112,344, exceeding the number sent in the previous year by 5470. The receipts likewise show an excess of £11,735, as against £11,341. The facilities afforded by the telegraph, both within the province and in the quick communication with the neighbouring colonies, are every year becoming more largely availed of, and, notwithstanding the moderate tariff of charges, are secured to the public without any additional cost beyond the original outlay. The total sum expended on telegraph lines and stations (completed and in progress) since its inauguration amounts to £99,178, including the erection of substantial buildings, twelve of which also afford accommodation for the transaction of Post-office business.

REPORT BY B. HERSCHEL BABBAGE, ESQ.

The following review, by the representative Commissioner for South Australia, is entitled to be enrolled amongst the records of the Intercolonial Exhibition :—

"St. Mary's, 18th December, 1866.

"Sir—I beg leave to report, for the information of His Excellency the President, and the members of the General Exhibition Committee, that I returned from Melbourne on the 13th December, leaving the charge of the South Australian Court in the hands of Mr. Knight, the indefatigable Secretary to the Victorian Commissioners.

"My previous letters have kept you informed of my proceedings with regard to the arrangement of the exhibits in our Court, and the steps which I have taken to obtain additional articles for the Exhibition. The total number of groups of exhibits, as originally forwarded from Adelaide, was seventy-four, which has been increased from various sources to one hundred, as enumerated in the last edition of the South Australian catalogue.

"As the counters allotted for the South Australian exhibits consisted of two sets of tables surrounding two of the piers of the main hall, with the floor space in front of them, I devoted one of them generally to mineral and metallic products and manufactures, and the other to those of the animal and vegetable kingdoms—thus endeavouring to introduce somewhat of system into my arrangements. Nitschke's very complete distilling apparatus was necessarily put up in one of the annexes, as it could not otherwise have been worked, and our agricultural machines and implements, which occupy more space than those from any of the other colonies,

Victoria alone excepted, were also put up in a distant annexe; so that to the casual observer, confining his attention to the main parts of the building, the South Australian exhibits appeared small as compared with those of some of the other colonies.

"Having often experienced the great inconvenience of distinguishing exhibits only by a number, requiring for explanation reference at every step to a catalogue, and having observed that people frequently pass by an article without understanding its nature or its uses, rather than be at the trouble of referring to a catalogue, I resolved to depart somewhat from the usual arrangement, and accordingly, in addition to its number in the catalogue, put upon each article, where practicable, its description, with such further information as I possessed regarding it.

"Opening the cases, checking, labelling, and dusting the exhibits, and arranging them upon the tables in the South Australian Court, all of which I was led to believe from our Hon. Secretary had already been done, together with putting their numbers and descriptions upon them, occupied so much of my time that but little was left for what I considered the more important part of my duties, namely—examining into the various exhibits from the other colonies, so as to obtain such information respecting them as might be useful to this colony on my return.

"It is then to my occupation by the mere mechanical and clerical duties of a clerk or agent, as well as to the shortness of the time allowed me for my visit to Melbourne (although I remained thrice the time originally assigned by the General Committee for these duties), that the meagreness of the present report must be attributed.

"The New South Wales Court adjoined our own, and I shall, therefore, in the first instance, point out several exhibits from that colony, which are interesting to us, leaving untouched all those numerous exhibits which do not immediately concern our own industries, and carefully abstaining from any expressions of opinion which may be supposed in the slightest way to infringe upon the province of the Jurors.

"The yield of cotton per acre has been a disputed point; it is, therefore, interesting to learn that a sample of New Orleans, grown upon the Hunter, produced 530 lbs. to the acre. In 1862, Australian Sea Island cotton was valued in London at rather more than 3s. per lb. New Orleans is a much less valuable variety; but if it were taken at 1s., and the cost of cultivation estimated in 1862 by the Queensland Commissioner, Mr. Marsh, at £9 per acre, were deducted, there would still remain a balance of £16 10s. per acre for rent, freight, and profit.

"From rich alluvial black soil, eighteen feet deep, in the valley of the Hunter River, is shown some samples of lucerne seed. This lucerne produces over six tons to the acre at each cutting, and can be cut from six to eight times in the year. This has been going on without intermission for twenty-five years, and with an undiminished produce. No manure is used, except such deposit as may be left by the floods of the river.

"The manufacture of woollen cloths, but especially tweeds, both at Sydney and Melbourne, is well worthy of the attention of South Australians. I am informed by Mr. Mellor, our Adelaide machinist, that complete machinery for a manufactory of this kind might be obtained in England for about £2000.

"We are in the habit of importing here many American 'notions,' and amongst others, carpet brooms made of the maize fibre. New South Wales

exhibits these articles, and could supply them equally as good, and at the same price, as the American ones. The husk of the maize also furnishes New South Wales with very good mats for country use.

"Some remarkable ores of iron (brown hematite) are smelted in New South Wales, which yield fifty-five per cent. of iron, and require no extraneous flux. The large (so-called) steel bell, whose clamorous sound daily warns visitors to the Exhibition of its approaching close, is cast from this ore.

"Victoria, as might be expected from her larger population, and the wealth derived from her goldfields, is considerably ahead of us in her manufactures. In many pursuits, whilst we are talking, she is up and doing. For several years, Mr. Samuel Davenport, with praiseworthy energy, has been impressing upon us the desirability of opening up a new industry, by growing flowers and distilling scents. Several exhibits of essential oils from Melbourne or its neighbourhood lead to the belief that our neighbours have taken up this industry in good earnest.

"The Victorian Board of Agriculture, again, has set us a good example by the exhibition of forty different descriptions of soil, with analyses and reports upon them. Unless greater general knowledge, an improved system of cultivation, the more general use of manures, and the judicious admixture of sheep-farming with tillage, are adopted in South Australia, our farmers may make up their minds to at once yield up their whilome superiority as growers of the finest wheat in the world, and to fall back into a lower class of agriculturists. The interests of an industry which has enabled us to export breadstuffs to an average value of three-quarters of a million sterling for the last ten years, ought surely to be cared for here, seeing that even Victoria does not hesitate about expending a few hundred pounds upon acquiring a scientific and practical knowledge of the capabilities of her soils.

"Several districts of Victoria as well as New South Wales furnish exhibits of pottery-ware, far beyond anything I have seen attempted here. When an efficient sewerage of Adelaide—not the shallow attempts at drainage which were in progress when I left—comes to be really carried out, the power of making such well turned-out glazed pipes, curves, and junctions as the Exhibition shows, would become of much importance to us.

"The soap factories of Adelaide—only one of which, by the way, exhibited in our Court—may well hide their faces before the products of the Victorian factories, which exhibited soaps of all qualities and kinds, from the coarse bars of the washerwoman to the delicately-scented cakes of the toilet table.

"Another nearly-allied product, glue—a manufacture, I believe, wholly untried here—is carried on extensively and with apparent success near Melbourne; nor should the trophies of candles of every kind and size, which adorn some of the Victorian Courts, be overlooked. These and other kindred works show how ready the Victorians are to embrace every opportunity of turning comparatively waste and worthless products into sources of emolument.

"Turning from these manufactories to implements, machinery, &c., there are several things worthy of our notice. Amongst these is a wool-press, by Home, of Melbourne, of a novel construction. It is divided into two parts in height, the upper half of which slides off sideways when the press is full and screwed down; so that, whilst the men employed are sewing up

the top of the pack, the upper part of the press can be filled again with wool, and thus time is economised. Some wine-presses, made of fluted cylinders of wood upon Lomeni's plan, are improvements both upon the plain smooth rollers and the rollers set with spikes, generally in use in this colony.

"Another machine, which I should much have wished to see in action, was a stone-breaker, with a kind of cogged iron receptacle, into which the stones are drawn and crushed by the power of an hydraulic press—an arrangement which is intended to obviate the constant breakage of the cams in Appleton's machine.

"The large number of earth-closets exhibited by different makers attests the attention which this latest improvement in sanitary matters is attracting in Melbourne. This is especially one of those cases in which the mere examination of a contrivance in an exhibition, without an opportunity of practically testing it in every-day use, leads but to little result. Two exhibitors, who are patentees for different processess for deodorizing night-soil, maintain each that their own process is superior to the ordinary earth-commode; but time forbade any practical examination into this question.

"The Art-Gallery exhibits include many that are good, and some that it must be admitted are rather mediocre. Amongst the useful are specimens of Osborne's photo-lithographic printing, an art that has been in use since 1860 in the Melbourne Crown Lands Department, and has saved several thousand pounds, but which is only being introduced at the present moment into our Adelaide office—affording another proof of the slowness with which we adopt our neighbour's improvements. In this process a collodion negative impression of a plan is first produced upon glass in the usual way, the scale being regulated by the distance of the original from the camera. A copy by the action of light is then made upon a sensitive albumenized paper, prepared with a solution of chromate of potash and gelatine. This paper is then coated with transfer ink, which adheres to the parts affected by light, but not to the other part of the paper. The surplus ink is next washed off with hot water, the undecomposed chromate dissolved out, and an impression of the print transferred in the usual way to a lithographic stone, from which copies may be struck off. This mode of printing is equally applicable to the ordinary routine of a lithographic printer's office as it is to a Government department; every kind of plan or drawing which depends for its effect upon shading by lines more or less intense, being capable of being copied by it.

"In the Exhibition are many products (some of them bidding fair to become important staples of industry) from the Melbourne Botanical Gardens, which are worthy of attention. Foremost amongst them is the sample of tea from the tea-plants. There are two varieties of these plants in the gardens, one from China and one from Assam, but there is very little difference between them. The first plants were raised in 1859, and their cultivation has been continued ever since, so that there are now many hundreds of them. A portion of these have been planted in the experimental garden, and the remainder are kept in pots for distribution and future use.

"Besides the tea plants, the experimental garden contains caper bushes, tallow trees, several varieties of the tobacco plant, olives, sugar beets, plants of Chinese grass cloth, collections of medicinal herbs, poison plants, varieties of perennial grasses, &c.

"A large number of trees are raised every year in these gardens, and distributed amongst the different Public Institutions of Victoria, to the number of sixty or seventy thousand annually, and the collections are constantly being increased by interchange with the productions of other countries.

"In the Botanical Department of the Exhibition is a collection showing the yield of tar, wood spirit, and acetic acid obtained from ten varieties of native trees, the chief of which are the *Acacia mollissima* (the Victorian silver wattle), stringybark, red and white gums, sheoak, honeysuckle, &c. Many of the eucalyptus tribe yield valuable oils by distillation from their leaves. From the fresh leaves of the *Eucalyptus amygdalina*, a species of peppermint, four per cent. of an oil is obtained, which is used as a diluent for oil of roses, &c., in the manufacture of scented soap. A tun of this oil has been exported from Victoria alone.

"Another botanical exhibit consists of specimens of paper made from the bark of different Australian trees, as well as from several varieties of grasses. Amongst these may be especially pointed out a paper made from the bark of the *Eucalyptus obliqua* (the stringy bark of the colonies), which grows upon the barren ranges of South Australia, Victoria, Tasmania, and the southern parts of New South Wales. A good writing paper might be made from this bark. Many others of our native trees would supply materials for paper making; but the stringybark appears to be one of the most promising, on account of the unlimited supply of bark which might be obtained from it.

"My time only permitted me to make a flying visit to some of the Swiss vineyards in the neighbourhood of Geelong. I was disappointed—both in the quality of their wine and in the cultivation of their vineyards. Judging from what I saw, it appeared to me that, instead of learning from the Swiss vignerons, they might profitably take lessons in their art from us in South Australia.

"I cannot conclude this brief notice of a few of the principal objects in the Victorian Exhibition, which may usefully suggest to us new occupations or new industries for our population, without bearing my testimony to the uniform courtesy exhibited by the Victorian Commissioners and their officers to the representatives from the other colonies, for which I beg publicly to thank them on behalf of South Australia.

"I have the honour, &c.,

"B. HERSCHEL BABBAGE,

"Representative Commissioner for South Australia.

"To the Hon. Henry Ayres, M.L.C., Special Executive Commissioner for the Melbourne and Paris Exhibitions."

INTERCOLONIAL EXHIBITION, 1866-67.

TASMANIA:

ITS EARLY HISTORY AND PROGRESS.

Extracted from the special Exhibition edition of the Hobart Town Mercury.

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TASMANIA:

ITS EARLY HISTORY AND PROGRESS.

PART I.

A GENERAL HISTORICAL ACCOUNT OF TASMANIA.

DISCOVERY, GEOGRAPHICAL POSITION, AND SETTLEMENT.

TASMANIA, formerly known as Van Diemen's Land, takes its name from Abel Jans Tasman, a Dutch navigator, sent out to explore the Great South Land, as Australia was then called, by Anthony Van Diemen, Governor-General of Batavia, in the seventeenth century. It lies between 40° 15′ and 43° 45′ south latitude, and between 144° 45′ and 148° 30′ east longitude, and is separated from Australia by Bass's Strait, which washes its northern shore. Its western shore is washed by the Indian Ocean, its eastern by the Pacific, and its southern by that portion of the ocean which connects the former two, and extends southward to the shores of the antarctic continent.

Tasman set sail for the Great South Land on the 14th of August, 1642, and touched at this island on the 1st of December in the same year, supposing it to be part of the Australian mainland, and left it on the 5th of that month for New Zealand. He could, consequently, have known little of the island, and what little he did know was confined to the neighbourhood of Storm Bay, the place of his debarkation. It was subsequently visited by Captain Marian, in 1772; by Captain Tobias Furneaux, in 1773; by the celebrated Captain Cook, during his third and final voyage to the Pacific, in 1779; by Captain William Bligh, afterwards Governor of New South Wales, in 1788; by Rear-Admiral Bruni when sent out to ascertain the fate of La Perouse and D'Entrecasteaux, in 1792; and others prior to the period of its settlement. But it was not known to be a separate island until 1798. The honour of that discovery was reserved for Mr. Bass, surgeon, of the royal navy, whose name the strait that divides Tasmania from the Australian mainland now bears; but in the completion or verification of that discovery, Captain Flinders afterwards became a sharer.

From Cape Grim, the north-western extremity of Tasmania, just above Circular Head, it extends south-easterly to South Cape, a distance of about 230 miles; and this is its greatest length. Its greatest width occurs near 41° 20′ south latitude, between Ordinance Point on the west and St. Helen's Point on the east coast, which is a distance of about 190

miles. According to a rough estimate, its surface is 24,000 square miles, or about 4000 square miles less than the whole extent of Ireland. Its total area, exclusive of islands and lakes, is 15,571,500 acres, or inclusive of these, 16,778,000 acres. The first attempt at the establishment of a settlement on the island was made by Lieut. Bowen in 1803, but it did not succeed. A more successful attempt, however, was made by Colonel Collins, the first Lieut.-Governor of the colony, in the following year, of which we now proceed to a brief account.

COLONEL DAVID COLLINS, FIRST LIEUTENANT-GOVERNOR OF TASMANIA.

Collins was favourably known to the British public in 1802 by his "Account of the English Colony in New South Wales," a work of great merit, singled out by the reviewers of that day as superior to anything of the kind that had yet appeared. It was dedicated to Lord Hobart, then principal Secretary of State, and it procured for him the patronage of that nobleman. Collins had long been Judge-Advocate of New South Wales, and possessed all the qualifications for a higher post.

At that time the British Government had determined on the establishment of a settlement at Port Phillip to relieve New South Wales of a portion of its surplus prisoner population, and Collins, who had formerly been with his father, General Collins, at the battle of Bunker's Hill, was at once raised to the rank of colonel, and sent to take charge of it. On his return from England, he found no difficulty in convincing Captain King, then Governor-in-Chief of New South Wales, that the banks of the Derwent would form a far more eligible site for a settlement than Port Phillip, and he was allowed to transfer those who had been intended to form a settlement at the latter place to the former. In his visit to the Derwent, he had been preceded by Lieutenant Bowen, who had brought over a small party from Sydney in August, 1803. This party consisted of Lieutenant Bowen himself, Dr. Mountgarret, the surgeon, a few soldiers, and a few prisoners. They landed at Risdon, on the east bank of the Derwent, but formed no permanent settlement there. Collins's party came over in two divisions in the following year, the first on the 30th of January, and the second on the 16th of February, 1804, and not thinking the situation of the camp at Risdon desirable, landed at Sullivan's Cove, whence they afterwards removed to the site on which Hobart Town now stands, so called by its leader after the name of his distinguished patron. Hobart Town is in 43 deg. south latitude, and in 147 deg. east longitude. It is on the west side of the Derwent, named after the Derwent in Cumberland, associated by Wordsworth, the poet-laureate, with the recollections of his childhood in these lines :—

> Among the mountains were we nursed, loved stream!
> There near the eagle's nest,
> Where thy deep voice could lull me,
> Glory of the vale!
> Kept in perpetual verdure by the steam
> Of thy soft breath.

The principal persons in this band of pioneers were Lieutenant-Governor Collins; the Rev. R. Knopwood, chaplain; E. Bromley, surgeon-superin-

tendent; W. Anson, colonial surgeon; M. Boden and W. Hopley, assistant-surgeons; P. H. Humphrey, mineralogist; Lieutenant Fosbrooke, deputy-commissary-general; G. P. Harris, deputy-surveyor; John Clarke and William Paterson, superintendents of convicts; Lieutenants W. Sladen, J. M. Johnson, and Edward Lord; forty-four marines; and three hundred and sixty-seven prisoners. The first Tasmanian house was built by Lieutenant Edward Lord on land adjoining the Macquarie Hotel, now Mrs. Hume's boarding-house, Macquarie-street. It was of wattle and dab, and had windows like the port-holes of a vessel. In this respect it was neither better nor worse than other rude attempts at an introduction of the forms of civilisation in founding new colonies. Anything is better than a thin texture of canvas as a protection from the influence of the weather. Other buildings equally rude in their construction followed that of Mr. Lord, and were extemporised just as the materials at hand or the occasion served. Government House itself was a mere cottage, too mean for the accommodation even of a modern mechanic. Its site was in Macquarie-street, just at its junction with Elizabeth-street.

Simultaneously with this attempt at the formation of a settlement on the southern side of the island, there was an attempt to form one at the northern. One of the same vessels that brought over Collins and his party was despatched to Port Dalrymple to survey the entrance of the Tamar; and the report being favourable, a small party of prisoners was sent from Port Jackson to form a settlement under the direction of Colonel Paterson, quite independent of that on the banks of the Derwent. This party landed in October, 1804, and took up their temporary abode at York Town, on the western arm of the Tamar, whence they removed in 1806 to the country above the North and South Esk, where they were delighted to find extensive plains equally suited for tillage and pasture, without a tree to hinder their prospect or progress. The Tamar was named by Colonel Paterson after a Cornish stream, and the valley of Launceston after a town in Cornwall, both in honour of Captain King, then Governor-in-Chief of New South Wales, and whose father had been a draper in Launceston, Cornwall, England. The northern settlement was then called Port Dalrymple, but Colonel Paterson proposed the establishment of a sea-port town at Launceston for the convenience of that side of the island, which was afterwards done with much success. Launceston is at the head of the Tamar, in the 41st degree of south latitude, and about the 147th degree of east longitude. Its distance from Hobart Town is usually reckoned 125 miles. At the time of its establishment, and for some years thereafter, Launceston had no connection with Hobart Town. Lieutenant Laycock made his way with a small party across the country from Launceston to Hobart Town in May, 1807, to the no small astonishment of the inhabitants of the latter place; and a loaded cart was soon afterwards sent from Hobart Town to Launceston, and made the whole journey without those in charge having to fell a single tree by the way. Still the settlement on the northern side of the island was not under the government of Hobart Town until 1812, that is, until two years after Collins's death.

During Colonel Collins's administration, which extended over a period of six years, little was done in the way of agricultural or pastoral settlement. A few acres of land were cultivated at New Town by the prisoners in charge of Clarke, the superintendent of convicts, and a few cattle were

imported from Bengal, and a few sheep from Port Jackson. The tillage was of the rudest description, and the settlers were consequently dependent on others for the supply of their breadstuffs. These they obtained chiefly from New South Wales, but the great flood in the Hawkesbury in 1806 swept away the superabundant store of that fine country, and maize and wheat rose to £5 and £6 per bushel. India had then to be looked to for supplies, but none were obtained thence until 1810, when the settlers on the banks of the Derwent were on the very verge of starvation. Wheat was now reduced to 12s. per bushel, and the change of seed was a great help to improved tillage. The sheep imported from Port Jackson in 1805 were sold on arrival at £5 apiece, and seem to have been depastured, along with the cattle from Bengal, chiefly on the banks of the Derwent, in the direction of New Norfolk, under the charge of Joseph Holt, general of the rebel army of Wexford in 1798, whose knowledge of the treatment of stock made him of great use to the settlement, to the Governor, and to himself. In the north, the progress of settlement was as slow and imperceptible during Colonel Collins's administration as in the south.

In 1808, Collins very narrowly escaped being implicated, as an accessory after the fact, in the deposition of Captain Bligh, then Governor-in-Chief of New South Wales, and successor to Captain King in that office. Bligh called at Hobart Town, after leaving Sydney, and was received by Collins with the respect due to his station. But when the latter heard by means of private despatches of what had taken place in Sydney, Bligh stated that Collins intended to have had him arrested, and that he would have done so, had not effectual means been taken to prevent it. But Collins did not live long enough to be called to account for this. In 1810 he attempted to establish a newspaper, called the *Derwent Star and Van Diemen's Land Intelligencer*, which was only just in time to chronicle his own death. He died on the 24th of March, 1810, whilst sitting in his chair, conversing with his attendant, and without any other warning of his approaching end than a slight cold. He was greatly respected by those who best knew him, and his remains were carried to their last resting-place in the churchyard of St. David's, Hobart Town, amidst a concourse of six hundred persons—a large number for so small a settlement. Sir John Franklin had a monument reared to his memory in 1838 on the spot of his interment.

COLONEL THOMAS DAVEY, SECOND LIEUT.-GOVERNOR OF TASMANIA.

On the death of Colonel Collins, the Government passed through the hands of three other gentlemen before it came into those of Colonel Thomas Davey, second Lieutenant-Governor of Tasmania. Lieutenant Edward Lord was Acting-Lieutenant-Governor until the arrival of Captain Murray. That gentleman was Acting-Lieutenant-Governor until February, 1812, when he was replaced by Lieutenant-Colonel Geils, who was Acting-Lieutenant-Governor until the arrival of Colonel Davey, on the 4th of February, 1813.

There was nothing during this long period of nearly three years more remarkable than a visit to Hobart Town by Major-General Macquarie,

Governor-in-Chief of New South Wales and its dependencies, of which Tasmania was then one. This took place at the latter end of November, 1811, when Captain Murray was Acting-Lieutenant-Governor; and Governor Macquarie was received with all the formality and marks of respect due to his rank. The town was illuminated, and addresses were presented, expressive of the sentiments of regard the settlers entertained for His Excellency's person, and of the obligations under which he had placed them by his unexpected visit. Everybody felt Governor Macquarie's visit to be quite an event, and His Excellency did not fail to turn it to account.

He looked round the site of the town, on which there were at that time only a few scattered cottages, and hinted at the desirability of a little more attention being paid to right lines in the erection of dwellings. He fixed upon a central spot, which he called St. George's-square, as a fitting one for a town hall and other public buildings, but of which there is now no trace. It fared otherwise, however, with the main streets of the city. These now bear the names which he then gave them. He called Liverpool-street after Lord Liverpool, then Prime Minister; Macquarie-street after himself; Elizabeth-street after Mrs. Macquarie, who accompanied him on this visit; Argyle-street after his native shire; and Murray-street after Captain Murray, then Acting-Lieutenant-Governor. Mount Nelson also owes its name to Governor Macquarie. He called it after the vessel which brought him to the Derwent, and carried him safely back to Port Jackson. It was also at his instance that Mount Nelson was converted into a signal station. He was a great favourite with the settlers during his stay, and Mrs. Macquarie was no less a favourite than was Governor Macquarie himself. The feeling of admiration for both among the settlers generally was fervent and unequivocal. Messrs. R. W. Loane, T. W. Birch, J. Ingle, and A. Whitehead signed the chief address presented to His Excellency on his arrival. Of the descendants of the persons whose names are scattered over the early records of the history of the colony, how many now remain? Who can tell? Yet these names should be preserved.

On the return of Governor Macquarie to Sydney, Lieutenant-Colonel Geils, of the 73rd Regiment, was sent to replace Captain Murray, and he remained until the arrival of Colonel Davey. Lieutenant-Colonel Geils arrived in Hobart Town in the month of February, 1812, and left in the month of February, 1813. He devoted such time as he could spare to agriculture, and formed a considerable farming establishment at Risdon. But what can any man do effectually with agriculture in a new country in the space of a year?

Still something considerable was done towards the advancement of the colony during the three years that elapsed between the death of Colonel Collins and the arrival of Colonel Davey, on the 4th of February, 1813. The settlement was in a very different position then to that in which Colonel Davey's predecessor had left it on the 24th of March, 1810. More land had been brought under cultivation. Its live stock had increased. More attention was being paid to the laying out of the town, and business was improving. Everywhere signs of progress began to appear. Others had laboured, and Colonel Davey was about to enter into their labours.

Colonel Davey appears to have been rather an eccentric man, not much fitted for his post. He was fond of practical jokes, and shared in the too

common taste of the day for spirituous liquors. But Lieutenant-Governors then were not judged of by the present standard. Half a century makes a marvellous difference in the manners of people, especially in a new country. It would be thought strange now for the Lieutenant-Governor of a colony to announce himself on a warm day with his coat on his arm, and to strive to amuse people by comical facial contortions. Yet that was Colonel Davey's habitual wont. Still, with all this disregard for what became him, he had many excellent qualities lurking under a somewhat uninviting exterior, and he was uniformly spoken of in terms of kindness. But that did not lessen the drawbacks under which he laboured. He was in the place in which it was demanded of him to set an example to others, and no valid excuses can be framed for a neglect of this. It must have lessened his influence greatly; but what he lacked in this respect Mrs. Davey supplied to some extent. She was an excellent lady, of a very meek and uncomplaining spirit, and very greatly esteemed.

Hitherto the ports of the colony had been closed, but in the first year of Colonel Davey's administration, that is to say, in 1813, they were thrown open to general commerce, and mercantile houses were established in Hobart Town. For want of those, the most necessary articles of consumption had often been wanting, but Messrs. Kemp and Gatehouse, and Messrs. E. Lord and J. H. Reiby, now supplied the settlers with English goods. This, too, shortly afterwards led to a desire to know more about the resources of the colony, and expeditions for this purpose were set on foot. Mr. Birch, an enterprising merchant, fitted out a vessel in 1816 to explore the western coasts of the colony, and was rewarded with one year's monopoly of the trade he had opened. Captain Kelly discovered Port Davey and Macquarie Harbour, and Captain Florence found a new and valuable species of pine, admirably adapted for the manufacture of household furniture. On the 1st of June, 1816, Mr. Andrew Bent issued the first number of the *Hobart Town Gazette and Southern Reporter*—a great improvement on the paper started by Colonel Collins in 1810, and thus brought into play one of the greatest agencies for advancing civilisation. In the cultivation of the ground, the plough took the place of the hoe, and corn was exported and a flour-mill erected. Passage-boats were placed on the Derwent, and the whale fishery on the coast was extended. The first emigrant ship from England arrived on the 18th of September, 1816. Provision was made for the better administration of justice, and Major Abbott, a member of the New South Wales corps, was appointed deputy-judge-advocate. A civil court for the recovery of debts not exceeding £50 was established, and in February, 1817, the foundation of St. David's Church, Hobart Town, was laid.

But amidst all these signs of progress, one dark plague-spot exhibited itself. The adventurous habits of a hunting life, favoured by the early necessities of settlement, led the more daring of the prisoner population to bushranging. This first began to show itself in the early part of Colonel Davey's administration. But it spread so rapidly, and was such a source of terror to the more peaceable portion of the settlers, that he resolved to declare the whole colony under martial law, and the greatest severities were inflicted under this edict both on free and bond. Some were flogged for quitting their houses by night, and others suspected of bushranging were captured and put to death. The number of these

desperadoes was not, perhaps, at any time very great, and this proclamation of martial law had but little effect in repressing the evil, however much it might have met with the approval of the settlers generally. It was a most arbitrary act, and, on its becoming known to the Governor-in-Chief, was promptly disallowed.

As a set-off to this, it should be mentioned that two hundred female prisoners were brought down from Sydney during Colonel Davey's administration, and being dispersed among the settlers, many of them formed matrimonial alliances, and became in time the mothers of happy and industrious families. Colonel Davey relinquished his office on the 9th of April, 1817, but remained some time in the colony as a private settler. He did not, however, succeed in that capacity, although he had received a grant of 3000 acres of land on his arrival, but went home and died on the 2nd of May, 1823.

COLONEL WILLIAM SORELL, THIRD LIEUT.-GOVERNOR OF TASMANIA.

The administration of Colonel Sorell spreads over a period of seven years. It began on the 9th of April, 1817, and ended on the 14th of May, 1824. He was colonel of the 48th regiment, and not by any means destitute of the capacity for governing a new settlement. But many things concurred to make his administration a task of much less difficulty than that of either of his predecessors. The colony had taken a fair start in the race of progress, and only needed to be kept in the right course. For this, Colonel Sorell's habitual prudence pre-eminently fitted him. He rather left the settlers to govern themselves, than sought to govern them. The hand that moved the machinery of government was kept out of sight. He had the highest quality of an able administrator, that of constantly governing without appearing to do so. Yet he was not wanting in the exhibition of firmness, or in the exercise of authority, when either one or other of these was required.

Of this he gave full proof in the steps he took for the suppression of outlawry on his first assumption of office. What Colonel Davey could not do by the proclamation of martial law, he did by much milder, but by no less vigorous means. He called the inhabitants of Hobart Town together, and urged them to decided efforts for the capture of the marauders. From eighty to one hundred guineas were subscribed—a large sum in those days—and rewards were offered for the apprehension of the ringleaders. This inspirited both the soldiers and the constables, and the military set out and tracked a party of them to a distance, where they came to an engagement, and Geary, their leader, was slain, and several others were wounded. This had the desired effect. The bushrangers saw that all were now in earnest, and they began to scatter themselves in different directions, and ultimately became afraid of one another. In a short time their number was reduced to three—Howe, Watts, and Brown. But Watts conspired with one Drewe, a stock-keeper, to seize Howe. This they did, but whilst conveying him to town, Howe stabbed Watts, shot Drewe, and escaped. Soon afterwards, however, Howe was betrayed by Warburton, a former accomplice, and shared Drewe's fate. That put an end to bushranging for the rest of Colonel Sorell's administration.

To this also may be added another proof of vigour, combined with judicious precautions. The population then was composed chiefly of prisoners and marines. Of these no formal account had been taken, but a few months after his arrival he resolved on a muster of the whole population annually. He also sent through the different districts, and required the attendance of the several classes who had to account for their families and stock, and he was thus put in possession of the name, residence, and civil condition of every settler. In other respects, there was nothing demonstrative in his administration, and there is little personal of him recorded. What follows, therefore, has reference chiefly to the progress of the colony during his administration.

The first emigrant ship from England arrived in the Derwent, as has been already remarked, during Colonel Davey's administration, on the 18th September, 1816. But the colony was now beginning to be better known in England. Many things conspired to this. Captain Dixon, Lieutenant Jeffries, and Mr. Wentworth had brought it before the British public in their respective works. It was favourably noticed in the *Quarterly Review*, and what was said there of it found its way into other publications of lesser note. People at home began to talk about the colony, and the inducements at that time to visit it were great. These were free grants of land, the loan of stock and seed, an assignment of convict servants, rations for the emigrants themselves and their servants for six months, and a good price for their wheat and meat when brought to market. The result of this was just what might have been expected. Vessels bound for Sydney touched at Hobart Town to discharge part of their cargo, and the emigrants on board declined to proceed farther. They thought they might go farther and fare worse. Other vessels were despatched direct from England, and in one year alone, the year 1822, there was an addition of six hundred to the population by this means. This accession of population continued during the whole of Colonel Sorell's administration. It did not amount to more than 2000 when he landed, if so many; when he left, it amounted to more than 12,000.

So surprising a change with regard to population could not be unattended with other signs of prosperity. All the elements of progress had fairly set in. The emigrant portion of the population had brought with them stout hearts and willing hands. They had also some means, and were bent on making what they had more. Consequently, agriculture took a great start, and in the third year of Colonel Sorell's administration—that is, in 1820—£20,000 was obtained for wheat exported to Sydney, although the most approved methods of cultivation had not then been adopted. At that time there were only two estates fenced in—the estates of Lieutenant Edward Lord and Colonel Davey, and those only partially. On other estates the crops were exposed to the constant depredations of cattle. But the early settlers chose for the most part open and fertile plains for this purpose, and the yield was very abundant, so much so that by the beginning of 1824 they must almost have doubled the amount of their export of wheat.

The like progression was also observable with regard to the live stock of the colony. Sheep, horses, horned cattle, and swine increased. At the close of 1821 there were 170,000 sheep in the colony, 550 horses, 35,000 head of cattle, and 5000 swine. For any later period in Colonel Sorell's

administration there are no returns, but when we take up the returns again we find that the increase must have been steadily progressing, and there is this to be noted: that a trade had sprung up between Sydney and Hobart Town at this time, not only in wheat, but also in meat. In 1820 44,000 lbs. of salt meat were exported to Sydney, valued at £1000.

Up to that time little attention had been paid to the breeding and rearing of sheep for the sake of their wool. That was not made an article of export until 1819, and then only to a very small extent. In that year the captain of the Regalia took a small quantity of Tasmanian wool in exchange for merchandise, and carried it home; but the speculation was a failure. It had no market price, and at that time there was a duty in England on colonial wool of 3d. per lb. But the improvement in the breed of sheep in New South Wales, through Mr. Macarthur's enterprise, attracted attention in Hobart Town, and the Tasmanian flockmasters paid more attention to this branch of colonial industry. Mr. Henry Hopkins had seen the wool taken home in the Regalia lying in the London Docks, in the worst possible condition, in 1820. Yet he was not to be discouraged by this. In September, 1821, he offered to buy wool by advertisement in the Hobart Town papers, and sent home twelve bales—the whole export of that year, bought at 4d. per lb., and sold in London at 7d. per lb., the expenses amounting to nearly half that sum. But, as the wool improved and greater care was bestowed on its getting up, others began to buy, and in 1823 the twelve bales had increased to five hundred and fifty bales in one vessel (the Deveron), and to a much larger quantity in other vessels. Mr. Hopkins's venture in 1821 only fetched £88, but the declared value of the wool exported in 1823 was £4399.

But we must either summarise or suppress, and we prefer the former course to the latter. We shall, therefore, compress the largest number of facts or events into the smallest possible space. In the early days of the colony, whales were more abundant in these seas than they are now. They were taken even in the Derwent. Of the first so taken, one Jorgen Jorgenson—a singular being, who afterwards distinguished himself greatly in the early history of the colony—declared himself the captor. But as the East India Company's charter did not admit of the employment of vessels of less than 350 tons between England and New South Wales, of which Tasmania was then a dependency, whaling was not much followed. A relaxation in that respect, however, was made in 1819, and whaling then became an important branch of colonial industry. But the disasters which attended this trade were many and frequent. The want of coin was very severely felt, and the Government not unfrequently paid the debts it had contracted in rum at £1 per bottle, which passed from hand to hand as bank notes or sovereigns do now. The settlers extemporised a currency of their own, which consisted of promises to pay, in small notes from sixpence and upwards. This continued until 1823, when the Bank of Van Diemen's Land was established, and an effectual check was put upon this. The names of the first directors of this bank were—E. F. Bromley, A. Bethune, F. Champion, G. C. Clarke, A. F. Kemp, A. Macleod, and D. Lord; R. Lewis, cashier. Still the system of barter continued, and it was no unusual thing for a peddling merchant to set out from Hobart Town with a cask of rum, a basket of tobacco, a chest of tea, and a bale of slop clothing, which he exchanged for sheep and cattle in the interior,

returning when he had done this with five or ten times the amount of the original cost of his merchandise.

During the administration of Colonel Sorell, there was a great improvement in the social condition of the colony. The Rev. Robert Knopwood came out with Colonel Collins, but was superseded by the Rev. William Bedford as principal colonial chaplain in 1822. The Rev. B. Carvosso, a Wesleyan missionary, touched at Hobart Town in the month of May, 1820, on his way to New South Wales, and embraced the opportunity of preaching, which he did with much success. A Wesleyan society was formed as one of the results of his labours, and the formation of the first Sunday-school in Tasmania followed on the 13th May, 1821. The Rev. Mr. Horton arrived on the 21st September, 1821, and obtained ground for the erection of a chapel; but it was left for the Rev. R. Mansfield to complete it two years afterwards, by means of timber and labour obtained from the Government, and by gifts and loans obtained from the society in England. The Presbyterian Church was founded in 1822 by the Rev. Archibald Macarthur, who was not, however, a member of the national church, although assisted in this effort by those who were so. A branch of the British and Foreign Bible Society was formed in Hobart Town in 1819, and £100 was contributed on the spot, and made up to £300 in the course of the year. The archdeaconry of Hobart Town was erected in 1824 in favour of the Rev. W. Scott, who came over as secretary to Mr. Commissioner Bigge, and whose reports were attributed to his pen, which interfered much with his usefulness. The Rev. John Youl, formerly a missionary at Tahiti, was the first chaplain on the northern side of the island, where he laboured with much acceptance, dividing his time between George Town and Launceston. The church in Launceston was a small wooden building, sometimes used as a court, sometimes as a temporary sleeping place for prisoners, sometimes as a stable. The Rev. Peter Connolly was the first Roman Catholic priest established in Hobart Town, and occasionally he made a visit to Launceston. For these early efforts to provide for the spiritual wants of a people so situated, no more suitable place could be found, and they ought not to be overlooked.

As Governor Macquarie had made it his business to visit Hobart Town soon after his arrival in Sydney, so he thought he could not do better than revisit it as the period for his stay in this part of the world drew to a close. He had not seen this portion of the country he was sent to rule over since he took such pains about laying out the streets of Hobart Town in Captain Murray's administration at the close of 1811; and during that time how greatly had it changed! He disembarked this time on the 24th of April, 1821, and fell into raptures with all he saw. He praised everything, the fine old English look the city had acquired—its increase from a few scattered cottages, with a population not exceeding 1500, to between 400 and 500 houses, and a population of 2700 souls. He went everywhere, saw everything, was pleased with everybody and everything, and made everybody pleased with everything, themselves included. He fell into his old habit of giving names. Colonel Sorell had had the region lying between the Shannon and the Clyde explored up to its junction with the Derwent in an early part of his administration. To this Governor Macquarie gave the name of Sorell. Brighton and Elizabeth Town also derived their names from him, the last being given in honour of his wife. Staffa, Ulra, Olmaigh, Perth, Campbell Town, Oatlands, Strathallan Creek,

and Roseneath were so designated by him. It is hard to say to whom his visit was a source of greater gratification, to the settlers or to himself. Trivial fond records of this kind have much to do with the early history of all new countries.

Colonel Sorell must have had a good deal of Governor Macquarie's kindly feeling, without any, shall we say, of his pardonable love for a little ostentation. His manners were free and unaffected, but without any approach to rudeness. He endeared himself to the settlers by lingering about the gate of Government House, and chatting with the passers-by whenever an occasion presented itself. He was at all times accessible, and had the happy knack of giving "No" for an answer, whenever he felt that he ought to do so, without exciting the displeasure of those whom he had to send away empty. The settlers deprecated his recall, but their petition to that effect was too late. His successor had been appointed, and he quitted office on the 14th of May, 1824. He had a pension, however, charged on the colonial revenue, which amounted at the day of his death, on the 4th of June, 1848, to the gross sum of £11,500.

COLONEL GEORGE ARTHUR, FOURTH LIEUT.-GOVERNOR OF TASMANIA.

Colonel Arthur was a very different man from his predecessors. He was as different from them as they were from each other. And the position of the colony over which he had been sent to preside was as different from that in which each of his predecessors had found it as the brief lapse of years could well have made it. Great principles had been silently at work, and great changes were looming in the distance.

An admixture of the free with the bond, which took place to such an extent during the last two or three years of Colonel Sorell's administration, had given birth to a desire to make the colony something better than that for which it was originally designed. Just before Colonel Sorell left, a company was formed at Leith with a capital of £100,000 to promote the welfare of the colony by an exchange of merchandise for its produce, and a succession of vessels was despatched for this purpose. These vessels brought out a number of Scotchmen, of great moral worth, who established themselves, with their families, successfully in different parts of the colony, and their shipments of goods broke up the monopoly of the local merchants, but tended greatly to the increase of trade.

Colonel Arthur arrived in the Adrian on the 12th of May, 1824, and was received with cold and formal respect. He was too keen-sighted not to have observed this, but it had no other effect than that of leading him to mature his plans for governing the colony in such a way as would in his opinion best please his superiors. It never seemed to have entered into his mind that the colony was ever to be made anything but that for which it was first chosen, and he was therefore utterly unable to enter into the aspirations for a more liberal form of administration that were now everywhere beginning to exhibit themselves. But we have less to do with disquisition than with facts in this case, and shall, therefore, make choice of facts which have respect to the social, commercial, and material progress of the

colony during Colonel Arthur's administration, in preference to those of a more strictly political character.

The administration of justice in a new colony is always a matter of prime concern. This had, however, hitherto been of the most lax and arbitrary description in Tasmania. But some days before Colonel Arthur's arrival, Mr. John Lewes Pedder—afterwards Sir John Lewes Pedder—came from England, and brought with him the charter of the Supreme Court of Tasmania, of which he was appointed first Chief Justice. This was proclaimed in the market-place on the 7th of May, 1824. The court was opened for business on the 24th of that month, the day of Colonel Arthur's arrival, and Mr. Joseph Tice Gellibrand presented his commission as Attorney-General. At a very early period, however, Mr. Gellibrand was removed from his office by Colonel Arthur for alleged unprofessional conduct, and this led to mutual hostilities and recriminations between them, which lasted during the whole of Colonel Arthur's stay in the colony. Mr. Gellibrand afterwards perished in the bush in Victoria, having lost his way on a short exploratory expedition. He was a man of great intellectual vigour, and was upheld by his professional brethren in what Colonel Arthur had been pleased to condemn. Mr. Joseph Hone—brother of William Hone, so celebrated at the beginning of the present century for the skilful defence he made of himself from the charge of blasphemy before Lord Ellenborough, and afterwards author of the *Day Book, Year Book, and Table Book*, arrived as master of the Supreme Court in the month of October, 1824, and long held that office, greatly respected by all who knew him.

Customs duties, first levied by authority of the Governor-in-Chief, and afterwards sanctioned by Parliament, were collected in Tasmania by the naval officer, who also performed the duties of treasurer. At this time, Dr. Bromley, who came out with Colonel Collins, as surgeon of the first fleet, was naval officer, and large defalcations appeared in his accounts. This was submitted to a jury of merchants, and they found that he had been made the victim of the daily peculations of his servants. His integrity was not impeached, but he was deprived of his joint offices, and Mr. Jocelyn Thomas was made treasurer, and Mr. Hamilton collector. The duties were now collected with greater vigour than before, and the merchants protested against what they believed illegal. But Colonel Arthur refused to listen to their complaints, and spoke of Hamilton as a traduced and excellent public officer. An attempt was then made to get up a meeting through the Sheriff, Mr. Dudley Fereday, to address the Governor-in-Chief on the subject, but the merchants were circumvented by the joint action of Colonel Arthur and Mr. Fereday, and the matter was allowed to drop. In this, however, as in the dismissal of Mr. Gellibrand, the conduct of Colonel Arthur was deemed arbitrary, tyrannical, and despotic.

The starting of the *Hobart Town Gazette and Southern Reporter* on the 1st June, 1816, by Mr. Bent, as the first permanent newspaper, has already been noticed. This, up to Colonel Arthur's time, had been under the official control and patronage of the Government, and Mr. Emmett had been its official editor. Mr. Bent, however, now resolved to throw off this official supervision, and Colonel Arthur laid claim to some share of the property on behalf of the Government. The matter was referred to the Governor-in-Chief, who decided in Mr. Bent's favour. Advances had been made by the Government for the purchase of type and other material,

and these Mr. Bent was expected to pay, but the paper was his own. The paper was, therefore, set free in the month of June, 1824, just eight years from the date of its establishment, and Mr. Evan Henry Thomas accepted the editorship. Correspondence was invited, and Mr. R. L. Murray, formerly a captain in the army, but now under Government surveillance, became a contributor under the signature of "A Colonist," and rather startled Colonel Arthur with the boldness and daring of his contributions. Colonel Arthur had no love for a free press, but there was no help for it. He had to submit, but determined to have a paper of his own. Mr. George Terry Howe established the *Tasmanian* in Launceston in 1825, but was drawn by offers of official patronage to Hobart Town, and, in connection with Dr. Ross, became printer of the *Government Gazette*. Mr. Bent complained of the piracy of his title, and changed that of his own paper into the *Colonial Times* in the month of August, 1825. The *Tasmanian*, of Hobart Town, soon followed, and discussed the various political questions of the day with ability and much moderation. Colonel Arthur's next move was to pass an act, which he did at the close of 1827, making it compulsory on every printer of a newspaper to have a license, to pay a tax of threepence on every number issued, and to give securities for penalties. Lord Bathurst was said to have suggested this, but it is far more probable that he was only the assenting party. Mr. Bent applied for a license, but was refused. His right to publish an advertising sheet was even disputed. He therefore started the *Colonial Advocate*, a monthly publication, on the 1st of March, 1828—the *Australasiatic Review*, by Mr. Murray, having made its appearance in the month of February in that year. Against this attempt to control and put down the press the colonists protested, and an address was presented to Colonel Arthur on the subject, signed by Mr. Meredith and several other magistrates. His reply was that the press could not be free so long as the colony was a place for the reception of prisoners. But Lord Goderich disallowed the act, and set the press free. In 1829, two papers were started in Launceston, the *Advertiser* and the *Cornwall Press*, the former the property of Mr. John Fawkner, and the latter that of Mr. S. Dowsell, which have their representatives to this day. In 1830, Dr. Ross was the printer of his own paper, the *Courier*, under the patronage of the Government, with an issue of 750 copies.

We go back now to the close of 1824, beyond which the thread of our narrative has carried us a little. On the 3rd of December, 1824, General Darling, Governor-in-Chief, proclaimed the independence of this colony on New South Wales. It was no longer a dependency of that colony, but was left to govern itself. Whilst here, General Darling was entitled to govern, but when he set sail, Colonel Arthur was responsible to the home office only. The latter also was now no longer addressed as "Your Honour," but as "Your Excellency," no mean alteration in the opinion of some. But something more substantial followed. Legislative and Executive Councils were appointed, consisting, it is true, of officers of the Government, but these formed the prelude to something further, and were steps in advance. They were the precursors to an exhibition of that spirit of independence which was slowly, but surely, rising in the colony, and of which we shall shortly see the fruits.

In 1825, the Van Diemen's Land Company was established, through the exertions of Captain Dillon, of the Skelton, who had visited Tasmania in 1820, and Mr. Edward Curr, who was at first secretary of the company,

and afterwards its agent. Among other things, the company was to benefit itself by improving the flocks of the colony, and making England less dependent on foreign countries for its supply of wool. Through Lord Bathurst, who consulted Colonel Sorell, then in England, on the subject, it obtained 250,000 acres of land on the north-west coast of the island in one block, which was valued to it at 2s. 6d. an acre; and the whole quit-rent charged, redeemable at twenty years' purchase, was £9575. But on the arrival of the company's first ship, the Tranmere, in 1826, this land did not suit the company, and its agent was allowed to exchange this one block for several others, which gave it the command over a large portion of the intervening country. It got 150,000 acres at Woolnorth; 20,000 at Circular Head; 10,000 at the Hampshire Hills; 10,000 at the Middlesex Plains; 150,000 at the Surrey Hills; and 10,000 at the islands on the coast. The total cost of this, including survey, was 2s. 6d. an acre.

This company had another establishment in New South Wales, formed at the same time, and for which it obtained a grant of 40,000 acres. At both places it engaged to improve the stock of the colony, and no doubt did so in the earlier stage of its history, by the introduction of valuable breeds of animals. But in this it was rivalled by private settlers. Mr. Patrick Wood imported bulls of the Fifeshire breed, and Captain Watson of the Normanby. Mr. R. Harrison imported sheep from the flock of the Marquis of Londonderry; Mr. Anstey, from the flock of Sir Thomas Seabright; and Mr. R. Wills, from that of Mr. Henty, of Arundel. Saxon sheep were imported by Messrs. Gillies. And in a very short time, little in that respect was left to be desired. But the losses to the importers were often considerable, and not less so to the Van Diemen's Land Company than to others.

The regulations for the disposal of the waste lands of the colony, and for the rectification of titles, during the whole of Colonel Arthur's administration, form such "a tangled skein" that there would be no possibility of unravelling it in any moderate compass. We must, therefore, dispose of the whole of this part of our subject in the fewest possible words. Grants had hitherto been made in Tasmania, as in New South Wales, pretty much at the will of the Governor for the time being, with or without conditions, before or after survey, yet under instructions from the home Government, which admitted of the widest latitude of interpretation, or had, at any rate, that sort of interpretation forced upon them. The survey of large blocks of land answered to the primitive mode of measuring a mile in Ireland. A string was tied to a dog's tail, and when he stopped that was a mile. That was the method of measuring off thousands of acres in these colonies, or much akin to it, and the apportioning out of smaller blocks was no great improvement on this. Such a mode of proceeding could not but lead to endless confusion, and in process of time the greatest uncertainty hung over titles. Again, matters were complicated by the claims of the Government to the right of resumption. But new regulations were issued by the Colonial Office for the sale and granting of land in the colony at the time of Colonel Arthur's arrival in Tasmania in 1824, and in 1826 letters patent were issued constituting Edward Dumaresque chief commissioner, and Peter Murdoch assistant commissioner, for the survey and valuation of Crown lands. Land might now be surveyed, valued, and sold for cash at a discount of 10 per cent., or on credit at four quarterly instalments, but not in blocks of more than 9600 acres to any

one purchaser. Free grants were offered to emigrant capitalists in blocks of neither more than 2650 acres, nor less than 320, with some conditions of settlement and cultivation, and reservations as to quit rent. Naval and military officers willing to emigrate were allowed to proceed to the colony, and got land on arrival on the most advantageous terms. More than five hundred grants, of 500 acres each, were issued to persons of this class in the four years ending 1831. But the Secretary of State reserved a discretion over and above these regulations, and Colonel Arthur did not scruple to exercise it. Grants at will were, therefore, continued during the whole of his administration, although not without some show of reason. And despite the freeness and fullness of the offers of land to capitalists, the newly-arrived emigrant, when looking out for a suitable unclaimed spot within any reasonable distance, was constantly met on inquiry with the exclamation, "All that is mine!" The institution of the "Caveat Board," in 1831, for the rectification and adjustment of titles, with the circumstances which led to it, is too long a story to be told here. But it prevented boundless litigation, and was a source of great public benefit.

With increasing immigration and increasing trade, increasing banking accommodation was required. The Bank of Van Diemen's Land, established in 1823, now enlarged its capital to £50,000, and became a joint-stock bank. The Tasmanian was a private bank, of which Messrs. Gellibrand were proprietors. The Derwent was established on the 1st of January, 1828, with a capital of £20,000, chiefly by persons connected with the Government. At or about the same time the Cornwall was established by the merchants of Launceston, with a capital of £10,000, and the facilities for monetary transactions were thus greatly enlarged. At a later period in Colonel Arthur's administration, the Bank of Australasia was established. It was inaugurated in 1835, and commenced operations in the following year. There was then the Tamar Bank in Launceston, with only 20 per cent. of its capital paid up, which was very small compared with its discounts and issues, and the Bank of Australasia was brought into immediate collision with it. The agent of the Bank of Australasia went to the Tamar every morning with a wheelbarrow, and carried away dollars in exchange for notes. The manager of the Tamar became alarmed, and shut up his books, but was relieved from his difficulty by time being given, after having been reminded that no bank was justified in trading beyond the limits of its paid-up capital. Colonel Arthur had a great antipathy to foreign banks, which was characteristic of his time, but had he remained in Tasmania until 1837, he would have seen the Union Bank of Australia, with a capital of £1,000,000, coming to dispute the ground with the Bank of Australasia, and take its share of the business monopolised at one time by the local banks.

Early in this notice of Colonel Arthur's administration we took occasion to remark on the growing spirit of independence in Tasmamia, which exhibited itself in a variety of ways and increased from year to year. In 1826, an attempt was made to found a collegiate institution for the education of youth and the advancement of science in the county of Cornwall, but it failed. In 1827, the Hobart Town Mechanics' Institute was established under the patronage of the Governor, with the Chief Justice president, and Mr. James Wood secretary. Dr. Ross lectured that year on mechanics, Mr. Gellibrand, senior, on astronomy, Mr. Hackett on steam-engines, and Dr. Turnbull on chemistry. In 1828, the King's Orphan

School, now the Queen's Asylum, was established for the reception of destitute or neglected children. In 1829, a more ambitious society than either of these was projected by Mr. John Henderson, a visitor from Calcutta, under the title of the "Van Diemen's Land Society," to which may be traced the present Royal Society of Tasmania. These were so many indications of an altered tone of feeling in the colony. But the reference above was chiefly to the development of a spirit of independence under its political aspects, to which Colonel Arthur was not by any means favourable.

Nearly twelve years had now elapsed since the arrival of Colonel Arthur, and the time of his recall was at hand. Let us look for a moment, then, at the material progress the colony had made during his administration. Amidst all the political turmoil that had sprung up, the corn grew, the sheep, cattle, and horses multiplied, the population increased, trade enlarged its boundaries, facilities for commerce extended themselves, and all the signs of advancing wealth and civilisation were everywhere becoming more apparent. A series of statistical tables were drawn up in 1836, from which these figures are taken :—The population had increased from 12,000 to 40,000; the revenue from £16,866 to £106,639; the imports from £62,000 to £583,646; the exports from £14,500 to £320,679; the colonial vessels, from 1 to 71; the churches, from 4 to 18. Some of these figures might admit of a slight correction, but they were, no doubt, substantially accurate. And what signs of greater progress could have been demanded within so limited a period?

Towards the close of Colonel Arthur's administration, the trade of the colony was much promoted and advanced by the establishment of South Australia and Victoria, the latter of these settlements being then known as Port Phillip. Every kind of colonial produce was in demand for the use of these settlements; sheep, cattle, and horses; wheat, flour, and every description of farm produce; colonial timber as fast as it could be produced and exported; and not a few imported articles of general consumption from England, India, and China.

Colonel Arthur's character has been variously estimated, but having regard to the principles by which he professed to be guided, he must be pronounced a good governor. He had no idea of making the colony other than what he found it, but events outran his view of things. His industry was constant, and his ability undoubted. His reputation, moreover, was unblemished. His official career terminated on the 30th of October, 1836, and he left the colony, not without carrying with him the best wishes of private friends.

SIR JOHN FRANKLIN, FIFTH LIEUTENANT-GOVERNOR OF TASMANIA.

Sir John Franklin was appointed Lieutenant-Governor of Tasmania on the 13th April, 1836, but did not arrive to assume the reins of government until the 6th of January, 1837. Lieutenant-Colonel Snodgrass had been acting Lieutenant-Governor from the date of Colonel Arthur's departure on the 30th October, 1836. This latter gentleman left Sir John a legacy of two of his nephews in the highest appointments in the colony, Captain John Montagu, colonial secretary, and Captain Matthew Forster, chief police magistrate. These gentlemen were the leaders of a powerful party

in the colony, and Sir John suffered for some time in his popularity by being supposed to be much influenced by their advice. To break up the spirit of party, which Sir John could not fail to observe, he added largely to the magistracy, but that did little towards the promotion of harmony.

Archdeacon Hutchins, who had taken a prominent part in the discussion of ecclesiastical matters in opposition to the Rev. J. Lillie, a minister of the Church of Scotland, died suddenly in June, 1841, and the Hutchins Grammar School in Macquarie-street, Hobart Town, was erected as an appropriate memorial of his worth. The vacancy occasioned by his death also suggested the establishment of the diocese of Tasmania. This was founded by letters patent on the 27th August, 1842, and Dr. Francis Russell Nixon was constituted first bishop. He arrived in Hobart Town in June, 1843, and opened his ministry on the 23rd of that month. The diocese was endowed by contributions raised in England, and an Act was passed giving the Bishop a salary independent of the estimates.

The subject of education largely engaged Sir John Franklin's attention. Colonel Arthur had attempted the establishment of a superior school in Tasmania in 1834, and the Rev. Mr. Rusden was nominated first master, but it failed. In 1839, Sir John Franklin was anxious for one of a more ambitious character, and wrote to Dr. Arnold, of Rugby, on the subject, who suggested a double chaplaincy, and a religious education rather than a merely secular one, and recommended that the head master should be permitted to take holy orders. In 1840, Sir John Franklin sanctioned the establishment of a college and the erection of buildings, and Mr. G. P. Gell, of the University of Cambridge, was nominated principal. By the advice of Mr. Gell and Archdeacon Hutchins, New Norfolk was selected for the college site, and the foundation-stone of the building was laid by Sir John Franklin, assisted by the members of Council, heads of departments, and Captains Ross and Crozier, of the Antarctic expedition, on the 6th of November, 1840. On the night following, thieves overturned the foundation and stole the inscription and the coins. But a worse fate than this awaited the institution. Its denominational character awakened the jealousy of the Presbyterians and Roman Catholics, and other religious sects joined in an expression of aversion to the establishment of a college of this description at the public expense. When projected, the Queen's school, although first established, was to have been a preparatory institution to the college, but that was in like manner a failure. The education of twenty-three scholars at it, principally the children of Government officers and wealthy shopkeepers, cost the public £1000 in 1843, and it at once became evident that that could not last. As a substitute, a proprietary school was suggested, and in due time followed.

At the time of Sir John Franklin's arrival, the schools for the working classes were exclusively Episcopalian, under the control of the Government. In 1838, the year following, this plan was altered, and the British and foreign system was adopted. Archdeacon Hutchins protested against the breaking-up of this monopoly, but had to yield to the general public wish, and masters trained at the Borough-road school, London, were sent out by Lord John Russell, at the cost of the colony, to take charge of the schools. On the arrival of Dr. Nixon, he petitioned to be heard by counsel against this system, and delivered an earnest address on the subject, but without effect. The system was continued until Sir William Denison's

time, when some alteration was made on the suggestion of Mr. Gladstone; and a son of Dr. Arnold, of Rugby—Mr. Matthew Arnold, who has since distinguished himself so much as a writer—was appointed inspector.

Whilst these great social changes were being carried out, other influences were at work. South Australia had been chiefly dependent on Tasmania on its first establishment for its wheat and flour, and that had greatly helped to promote the trade of this colony. This was in 1839-40, but in 1841-42 the public works were stopped in Adelaide, and they began to grow corn for themselves. Many, however, were thrown out of employment there, and it being the general impression that transportation to this colony was about to cease, a vessel was despatched thither to see whether some of the more necessitous could not be induced to leave. This attempt at "kidnapping," as it was then called, met with great indignation at Adelaide, and had to be desisted from. Sir John Franklin was no approver of it. Yet the demand for labour, arising out of the high price the settlers had got for their produce, and the investment of the proceeds in land, led him to the conclusion that something must be done to increase the population. He therefore proposed the expenditure of £60,000 on the introduction of suitable working families from Great Britain, and Mr. Henry Dowling was chosen to give effect to the wishes of the Government in this respect, subject to certain regulations.

The scheme that had been determined upon for the introduction of these families was either not well adapted for the purpose, or was not well worked. There was also some miscalculation as to the ability of the colony to sustain it, and some misapprehension as to the intentions of the home Government with regard to the discontinuance of transportation. The Land Fund, which rose to £52,000 in 1841, rapidly declined between that and 1843, and Lord Stanley had before the latter of these periods decided on the renewal of transportation. An exceedingly useful class of emigrants had arrived in the interim, and for a year or two the subdivision of town property was rapid, and things generally wore an agreeable aspect. But the emigrants stood aghast when they found that they had to compete with prison labour, and began to move off to the neighbouring colonies, after having been brought out at so much public and private cost, to make a fresh start in the world. Mr. Dowling himself was a great sufferer. He lost on his agency upwards of a thousand pounds.

A still more disastrous state of things was now about to supervene. One of those crises to which all new colonies are more or less subject, and which in the early stages of their existence are generally of periodical occurrence, swept over the whole of these colonies with the rapidity and force of a hurricane, and this colony came in for its full share of the effects. For the production of this, there were many concurrent causes at work, not very clearly foreseen, but well enough understood afterwards. There had been great speculations in land and stock at high prices, and an immense quantity of goods poured into the markets from all quarters, much in excess of the wants of the people. An unhealthy system of credit was generated, and stock and agricultural produce were raised at a cost for which remunerative prices were not likely to be obtained long. Foreign wheat was thrown into the market to compete with our own, which had now become nearly equal to our wants. For live stock, once at fabulous prices, there now was no demand. Everything went down. The whole commercial fabric was

shaken to its centre. And when this state of things was at its worst, thousands of British offenders were thrown on our shores. It was not a mere panic that had to be endured, but a total uprooting of the existing order of things, preparatory to one that was to be entirely new. Sheep were to be bought at half-a-crown a-piece, and wheat at 2s. 6d. to 2s. 9d. per bushel. It seemed as though attention to rearing of stock and the raising of wheat was now at an end in the colonies. But the discovery of the system of boiling down sheep for their fat in New South Wales fixed the minimum price for them at 8s. per head; and we were not long left without proof that wheat growing might still be made to pay. The ordeal the colony had to go through was severe, but she bore up well under it. Recovery in such cases is slow, but should never be regarded as hopeless.

When Sir John Franklin arrived in 1837, the land in cultivation was only 89,528 acres; when he left in 1843, it was 157,340 acres. It had consequently nearly doubled itself. The horses had risen from 8243 to 13,360; the horned cattle from 74,500 to 83,195; the sheep from 906,813 to 1,449,504. Its population, too, had largely increased. At the former of these two periods, it was 43,679; at the latter it was upwards of 60,000. The material progress of the colony was, therefore, keeping pace with its social progress, although subjected as all colonies are in the earlier stages of their growth to the alternations of hot and cold fits.

Sir John Franklin accompanied Captain Flinders in his voyage of discovery, and had a profound veneration for the memory of that distinguished explorer. He could not leave the seat of his government himself to visit Adelaide, but Lady Franklin visited it at the close of 1840, during Colonel Gawler's administration, and proceeded thence to Port Lincoln to make choice of a spot on which to rear a monument to Flinders's memory. Stamford Hill was the place chosen, and a monument was raised there at Sir John Franklin's expense, bearing the following inscription :—

This place,
from which the gulf and its shores
were first surveyed,
on the 26th of Feb., 1802, by
MATTHEW FLINDERS, R.N.,
Commander of H.M.S. Investigator,
and the discoverer of the country now called South
Australia, was
on 12th Jan., 1841,
with the sanction of Lieut.-Colonel GAWLER, K.H.,
then Governor of the Colony, then set apart for,
and in the first year of the
Government of Captain C. GREY,
adorned with this monument,
to the perpetual memory of the illustrious navigator,
his honoured Commander,
by JOHN FRANKLIN, Captain R.N., K.C.H., K.R.,
Lieut.-Governor of Van Diemen's Land.

This monument was in the form of an obelisk, and it was erected at a cost of £250.

The immediate cause of Sir John Franklin's recall was a rupture with Mr. Montagu, Colonial Secretary, whom he had dismissed for conduct unbecoming his position. The story is too long for repetition here, but Lord Stanley, now Earl Derby, was greatly blamed for the part he took

in this affair. Sir John's successor arrived before he received an official notice of his recall, and he at once quitted Government house and obtained private lodgings. He was a man of deep and unaffected piety, and was much and sincerely respected. His official career was terminated on the 21st of August, 1843, and he lost no time in leaving the colony. He was most cordially greeted on his arrival, and left behind him a very high appreciation of his great moral worth.

SIR J. E. E. WILMOT, SIXTH LIEUTENANT-GOVERNOR OF TASMANIA.

Sir John Eardley Eardley Wilmot had been one of Lord Stanley's followers in the House of Commons, and probably owed his appointment to that circumstance. He had long represented Warwickshire in Parliament, and inclined rather to the Liberal than to the Conservative side of the House. He was also Chairman of the Quarter Sessions in his native county, and had contributed several papers on prison discipline. It might, therefore, have been supposed that he was well qualified for that which was now principally to engage his attention. But, unhappily, he had to follow the instructions of others, and not the dictates of his own judgment. And this, no doubt, had much to do with the alleged failure of his administration.

This is intimated thus early, because his whole administration was made up of a series of contests and struggles with the colonists and with the Colonial Office, which culminated in an abrupt termination of his official career on the ground of his alleged failure to accomplish what he had been sent out to effect. That decision was not communicated to him by Lord Stanley, to whom he owed his appointment, but by Mr. Gladstone, his successor. It must have come to that, however, sooner or later, had Lord Stanley remained in office, for his failure was mainly owing to the singular fidelity with which he followed out the instructions that nobleman sent for his guidance. We must, however, take the few, but not unimportant events which attended his short career in their order.

Sir Eardley Wilmot assumed the reins of government on the 21st of August, 1843, and made a favourable impression on the colonists, notwithstanding some severe animadversions on his appointment by the London press, which had preceded him. But two or three of the earlier acts of his administration tended to wear off that impression. First, he was brought into collision with the bench by commuting the sentence of a notorious bushranger whom Judge Montague had condemned to death, and whom almost everybody else said ought to have been hanged, as he afterwards was for some other crime. Next, he discouraged the formation of a yeomanry corps, who had chosen Messrs. Keach and Leake treasurer and secretary, for the suppression of bushranging, by informing those gentlemen that it was the prerogative of the Queen to levy armed men, and that while he praised their martial ardour, he must decline his sanction. Again, having accepted the office of President of the Tasmanian Society, which had been formed by Sir John Franklin, he proposed a series of alterations in its organisation, which were distasteful to some of the existing members, who thought their views and wishes not sufficiently con-

sulted. But greater things than those required his attention, and greater causes for dissatisfaction with his administration arose as he proceeded.

On his arrival, he traversed the island, and made its agricultural condition the subject of earnest and searching inquiry. Shortly afterwards, he attended a meeting of the Midland Agricultural Association, and dilated on the advantages of agriculture, and on the importance of independent tenants, and an industrious peasantry. Addressing some of those rather above this class he said:—" You are to consider yourselves as the column of a lofty pillar; but depend upon it, a tenantry form the pedestal—a virtuous, moral, and industrious peasantry is the foundation upon which that pillar rests. I see around me some of your largest proprietors, who this day are lords of wastes, and princes of deserts; but who, if the system of tenantry be carried out as fully as it deserves, will become patriarchs; and the future Russells, Cavendishes, and Percys of the colony may be proud to date their ancestry from any one of you." This led to something equally complimentary in return, but agriculture was at that time at a very low ebb, and required something more than day-dreams of this description to sustain it. Tenants stood little chance of long remaining independent with wheat at 2s. 6d. to 2s. 9d. per bushel, and industrious peasants had no very bright prospect before them, with prisoners pouring in at the rate of five thousand a year to compete with them in the labour market.

Sir Eardley Wilmot ceased to hold the reins of office on the 13th of October, 1846, and died in retirement in the colony on the 3rd of February, 1847. His remains were deposited in St. David's burial-ground, near the tomb of Collins, the first Lieutenant-Governor.

Amidst the political turmoil in which his short colonial career was passed, the material interests of the colony were neither overlooked nor retarded. On reference to the statistical tables of the colony, we find them bearing favourable comparison with those of former periods. The land under cultivation had increased during the three years from 121,938 acres to 152,343 acres. On the live-stock statistics, the increase was not so marked.

SIR W. T. DENISON, KNT., SEVENTH LIEUTENANT-GOVERNOR OF TASMANIA.

Mr. Charles Joseph Latrobe, afterwards first Governor of Victoria, was acting Lieutenant-Governor of Tasmania from the time of Sir Eardley Wilmot's recall, October the 13th, 1846, until the arrival of Sir William Denison on the 25th of January, 1847, and employed himself in a careful and scrutinising examination into the state of the probation department, and not only suggested many improvements in its management, but concurred in the general wish for its extinction. He never met the Council, and, consequently, left little behind him worthy of record.

Sir William Denison had been employed in the British dockyards, and was armed with full and minute instructions as to what he was to do on arrival in the colony.

During the latter part of Sir Eardley Wilmot's administration, public

feeling ran high on Lord Stanley's probation system, and petitions were prepared against it. A few sentences from one drawn up at that time by Mr. Pitcairn, a Hobart Town solicitor, who had never before meddled with politics, will better show the frightful state of things which then existed than any language we can employ. He says :—

If you look at the last map of Van Diemen's Land (Mr. Frankland's) you will see, at the entrance of D'Entrecasteaux's Channel, Southport. Here there are 500 men. Above, at Port Esperance, 400 men. Above this, along the banks of the Huon, the farmers begin. At Port Cygnet, up the Huon, there are 350 men; proceeding up the channel, you come to Oyster Cove, 250; Brown's River (just above North-West Bay, and five miles from Hobart Town), 500. Taking now the main road from Hobart Town to Launceston (the lands on each side being all settled, fenced, and improved), you will see Glenorchy (eight miles from Hobart Town), 150 men; Bridgewater (twelve miles), 100; Cross Marsh (thirty miles), 100; Jericho (forty miles), 100; Oatlands (fifty miles), 180; Ross (seventy miles), 120; and Cleveland (eighty-six miles), 250. At Perth (one hundred miles from Hobart Town and nineteen from Launceston), there was another gang, which was recently withdrawn. Leaving the main road, there are at the Broad Marsh 240 men; at Fingal, 400; at Buckland, 250; at Jerusalem, 500; at St. Mary's, 300; at Westbury, 200; at Deloraine, 300; at the Mersey, 200. In all, twenty gangs, comprising 5500 men.

The prayer of this petition was moderate enough. All that was sought for was a reduction in the number transported to the standard of 1840, an improvement in the discipline, and provision for the gradual and total abolition of transportation. But things were not at all improved on the arrival of Sir William Denison, or for a long time thereafter. Earl Grey had, indeed, held out some expectations of an amelioration in the system of management, and of its ultimate abandonment. Acting on his advice, Sir William Denison addressed a series of questions to the magistrates of the territory, the first of which was—"Do you think it desirable that transportation of convicts to this country should cease altogether?"—a question no doubt harmless enough in itself, and one to which Sir William Denison probably expected as many answers in the negative as in the affirmative. But it set the whole country in a blaze, and what followed would fill whole volumes, instead of admitting of compression into any such space as we have at command.

Meetings were held in Hobart Town and Launceston to petition against transportation. In the month of July, 1848, Sir William Denison laid a despatch from Earl Grey on the table of the Council, and whilst noticing its harmony with the wishes of a large proportion of the free inhabitants, exhorted them, whatever the issue, to confide in the goodness of God in this the crisis of their fate. But Earl Grey shifted his ground, under the pressure of unexpected events, which rather added fuel to the fire in Tasmania than tended to extinguish it. The Neptune was sent to the Cape of Good Hope with convicts, and the settlers refused to receive them. She was then ordered on to this colony, and her cargo was landed here in November, 1849. The Harkaway entered the Sydney Heads on the 10th June, 1849, with a similar cargo, and Sir Charles Fitzroy was desired to send them away—if necessary, at the colonial cost. The Randolf made a similar visit to Hobson's Bay, but the people of Melbourne opposed the landing of her cargo, and Mr. Latrobe had to send them to another part of the country. We had to submit to the landing of the Neptune's cargo, and to others that followed, because we could not help

ourselves. But the stone had been set rolling, and it was urged on by those things at an accelerated pace.

Earl Grey was visited with unavailing reproaches for his want of good faith, and great heart-burnings were engendered in the colony. An organisation in favour of transportation was got up, but it was feeble at starting, soon languished, and in a short time entirely disappeared. Mr. T. G. Gregson had a great hand in putting an extinguisher on this. But the movement for its abolition acquired strength as it went. A London agency was established, and Mr. J. A. Jackson was appointed to plead the cause of abolition there. On the 9th of August, a meeting was held at Launceston, at which the following resolution was adopted:—"Resolved, that the whole of the Australian colonies are deeply interested in preventing the continuance of transportation to this island. That the Launceston Association for promoting the cessation of transportation to Van Diemen's Land be hereby requested to address a letter to the respective colonial secretaries, speakers of legislative bodies, municipal authorities, and other influential parties in these colonies, earnestly requesting co-operation to ensure the attainment of the great object we have in view." Messrs. Douglas, Du Croz, and West drew up the letter referred to. Meetings were held at the house of Mr. Henry Hopkins, Hobart Town, for weeks, and at one of these Mr. Pitcairn drew up the following agreement, which was signed by the gentlemen present:—"We the undersigned, deeply impressed by the evils which have arisen from the transportation of criminals to the Australian colonies, declare that transportation to any of the colonies ought for ever to cease, and we do hereby pledge ourselves to use all lawful means to procure its abolition.—Robert Pitcairn, Thomas D. Chapman, Henry Hopkins, G. C. Clarke, Joseph Allport, John West, F. Haller, G. W. Walker, William Rout, Henry Smith, P. T. Smith, Robert Officer."

In this resolution and agreement we have the germ of the Australasian League, which was so soon after to be formed. That arose out of the Rev. Mr. West and Mr. W. P. Weston being sent as delegates to Melbourne, and the following is a copy of the solemn engagement the members of the league entered into:—

THE AUSTRALASIAN LEAGUE.

The League and Solemn Engagement of the Australian Colonies, declared by the Delegates in the Conference held at Melbourne, February, 1851.

Whereas in 1840, by an Order in Council, the practice of transporting convicts to New South Wales was abandoned by the Crown, and whereas by divers promises the Government of Great Britain engaged not to send convicts from the United Kingdom to New South Wales, New Zealand, Victoria, or King George's Sound. And whereas by an Act of the British Parliament transportation to South Australia was positively prohibited. And whereas Lieutenant-Governor Denison, in 1847, declared to the colonists of Van Diemen's Land Her Majesty's most gracious purpose that transportation to that island should be discontinued. And whereas the colony of Van Diemen's Land has been deeply injured by the pouring in of enormous masses of transported offenders. And whereas divers and repeated attempts have been made to depart from the letter and spirit of these promises. And whereas the avowed object of Her Majesty's Secretary of State is to transfuse the convicts disembarked in Van Diemen's Land through the Australasian colonies, and thus to evade the spirit of the promises and Act of Parliament so made. And whereas large tracts of land have been purchased by the colonists from the Crown, many millions of capital invested in improvements, and many thousands of Her Majesty's subjects have settled in Australasia

on the pledged faith of the Crown not to disturb their social welfare by the importation of crime. And whereas the native Australasians are entitled to all the rights and privileges of British subjects, and to the sympathy and protection of the British nation. And whereas many and varied efforts have been made to induce Her Majesty's Ministers and the British Parliament to terminate the practice of transportation to these colonies, but without success. Now, therefore, the delegates of these colonies, in conference assembled, do declare their league and solemn engagement, to the effect following:—

1st. That they engage not to employ any person hereafter arriving under sentence of transportation for crime committed in Europe.

2nd. That they will use all the powers they possess—official, electoral, and legislative, to prevent the establishment of English prisons, or penal settlements, within their bounds; that they will refuse assent to any projects to facilitate the administration of such penal systems, and that they will seek the repeal of all regulations and the removal of all establishments for such purposes.

And, lastly, That they solemnly engage with each other to support by their advice, their money, and their countenance, all who may suffer in the lawful promotion of this cause.

From that hour, transportation to Tasmania was doomed. But two or three things conspired to hasten its end. First, the visits of the delegates to the other colonies secured their earnest and effective co-operation. Secondly, elective Legislative Councils were granted to the colonies, and they all concurred in their protests against a continuance of transportation. New South Wales took the lead, South Australia followed, and Tasmania brought up the rear. In the Tasmanian Council, Mr. Dry was unanimously chosen Speaker, and Mr. Sharland brought forward a series of resolutions, in which the continuance of transportation was denounced in the most forcible terms. But a third and no less striking event contributed its share to the completeness of the success of this movement. Gold was found in abundance on the Australian mainland, first in New South Wales, and afterwards in Victoria. This, in the opinion of some, might not have had much to do with it; but it was certainly felt in England that it would be impossible to keep a prison population so near to newly-discovered goldfields under proper restraint. It was not, however, until the 10th of August, 1853, that the despatch announcing the discontinuance of transportation to Tasmania reached the colony. Medals were struck in honour of the event, and the jubilee was kept with great public rejoicings. The colony was then just fifty years old—Lieutenant Bowen having set sail from Port Jackson for the Derwent in 1803.

On the subject of transportation, Sir William Denison was never thoroughly of one mind with the colonists, and there were some other things in which he was not agreed with them. But his administration was, on the whole, a favourable one. He exerted himself much for the promotion of its material interests, and the Bridgewater causeway is quoted as a proof of his engineering skill. He also exerted himself greatly to have the colony well represented at the first "Great World's Show" in 1851. But more fortunate still, to his administration we owe the passing of the "Constitution Act" under which we now live, with the sanction of Her Majesty, but which being reserved for Her Majesty's assent, did not come into operation until after he had left. It was passed on the 1st of November, 1854, and he left for New South Wales on the 8th of January, 1855, with the reputation of being one of the ablest governors these colonies had ever had. On the occasion of his departure, a testimonial, valued at 2000 guineas, was presented to him.

SIR H. E. F. YOUNG, FIRST GOVERNOR-IN-CHIEF OF TASMANIA.

Sir Henry Edward Fox Young arrived in the colony on the 8th of January, 1855. He had previously been Governor of South Australia, and, during a tolerably long residence there, had become well acquainted with these colonies. He was the first civilian they had to rule over them there, and the first likewise here. His habits of business in South Australia had been close and attentive, and he was a good despatch writer—no mean qualification when governors are not controlled by responsible advisers. But he came to this colony at a time in which responsible government was about to be inaugurated, and the rôle he had to perform was one to which he had not before been accustomed. He came to South Australia from British Guiana.

When Sir Henry Young assumed the reins of government in Tasmania, there was everything to make the people quiet, contented, and happy. The anti-transportation agitation had subsided more than a year, and there were no signs of the fulfilment of Sir William Denison's prediction that the cessation of transportation would turn Hobart Town into a mere fishing village. On the contrary, money was plentiful, and trade flourishing. This, however, was mainly owing to the discovery of the Victorian goldfields, which had created a demand for our produce—wheat, oats, barley, and all descriptions of colonial timber; this last in particular. But to the far-seeing, it could hardly have been expected that this would continue when the freshness of the diggings had worn off, and the people of Victoria had begun to produce for themselves, without a large amount of push. It will be as well, therefore, for us to see how things then stood colonially, as this was to be a new starting-point in our career, whether for better or worse.

At the close of 1854 the population stood at 64,874. The land under cultivation amounted to 127,732 acres. There were 17,384 horses in the colony, 102,752 horned cattle, 1,831,308 sheep, and 22,598 pigs. The shipping inwards amounted to 198,612 tons, and outwards to 200,398 tons. The export of wool amounted to 4,419,276 lbs., valued at £325,384 sterling. The fruits and vegetables exported yielded £106,320. The total imports for the year were £2,604,680, and the total exports £1,433,021. The timber exported was valued at £306,857. The expenditure of the commissariat amounted to £280,317. The revenue from the sale and rental of the Crown lands was £112,225. On how many of these items was not the cessation of transportation likely to create a reduction? And on how many more the certainty of those then toiling on the goldfields learning to help themselves to agricultural produce and timber? But that was the state of things, and we must look to the later statistical tables of the colony for what followed. Meanwhile, it is a noticeable fact that the colonists were so well off then as to be able to subscribe, between the months of March and August, 1865, for the relief of widows and children of those who had perished in the Crimean war the sum of £26,294.

During the whole of Sir Henry Young's administration, or nearly so, much was said of the probability of finding a paying goldfield in Fingal. This question, indeed, began to be agitated so far back as 1852—that is to say, between two and three years before his arrival. But such of the

people as had the *auri sacra fames* strong upon them gave the preference to the goldfields of the other colonies. Some went to Victoria, others to New South Wales, never to return, and the population was thinned. Still there were a few who had faith in Fingal, and toiled on in the hope of doing more than they had yet been able to achieve, until the Government at length devoted a sum of £2000 towards a fair trial of the ground, and about 120 ozs. of gold were obtained as the result of this outlay, and a good breadth of ground reported upon. This was in 1857. One or two quartz-crushing companies were then started, but failed for want of better management—the Midland Mining Association in particular. Yet there are hopes of something still being done in Fingal, of which favourable notice was taken at the opening of the International Exhibition in Hobart Town, in December, 1861.

The exhibition itself was a great success, and reflected credit on all connected with it.

Other things not taken up in the foregoing narrative of events may here be mentioned. The Launceston and Western Railway movement was first agitated in 1857. In the same year, Hobart Town was first lighted up with gas, and telegraphic communication between Hobart Town and Launceston was established. On the 12th of August, 1858, much property was destroyed, and several lives were lost, by floods in different parts of the colony. In the year following the volunteer force was enrolled, the artillery company being first formed.

Sir Henry Young resigned his governorship into the hands of Colonel Gore Browne on the 18th December, 1861, and took his departure for Europe next day. He had proved himself an able administrator in South Australia—the Goolwa and Port Elliot Railway being of his projecting, but there was not the same scope for his powers here. Under a different form of government, he was in the hands of his Ministers.

COLONEL GORE BROWNE, SECOND GOVERNOR-IN-CHIEF OF TASMANIA.

The time has not yet come for a narrative account of Colonel Gore Browne's administration. The events connected with it are fresh in everybody's recollection, and comment would be out of place. In his case, as in that of Sir Henry Young, a new order of things had to be met, and, if possible, with increasing difficulties. First attempts at responsible government are difficult enough in the most favoured countries, but much more so in those in which, as in this, there are counteracting forces at work. If we had started in this race with a full treasury chest, or had we, after starting, been able to possess ourselves of a Fortunatus's cap, it might have been otherwise with us. But there is no denying the fact that we have had to contend with difficulties to which none of the other colonies to whom constitutions were granted in 1855 have been subjected. And these are difficulties with which Colonel T. Gore Browne has to contend in common with others.

For nearly two whole years, Ministers made their public works scheme their great cry, but when they got Parliament to assent to it in 1865, in the exact form in which it was presented, their zeal in the prosecution of these suffered a great decline. They were authorised to raise £102,000

for the prosecution of these works, and great expectations were held out by Ministers that year of what they would do for the public revenue by leading to the consumption of a larger quantity of duty-paying articles. But at the date of twelve months from the passing of the Public Works Acts, under which the Treasurer was authorised to borrow this £102,000, not quite £20,000 had been spent, and it does not amount to a great deal more now. Mr. Charles Meredith has, indeed, in his address to the electors of Glamorgan, his former constituents, given an account of the sums voted for each work, with the contracts taken, which we here subjoin:—

PUBLIC WORKS AUTHORISED, 1865.

	Vote.			Contract.		
The Patersonia and Ringarooma Road	£8,400	10	11	£3,159	0	0
Bridport, Scott's New Country, and Ringarooma Road	9,850	4	10	4,543	0	0
Part of Direct Huon Road, from Hobart Town to Leslie	15,168	0	0	15,168	0	0
The Government Road through Franklin, Huon	2,162	8	0	1,836	0	0
West Tamar Road	2,000	0	0	2,000	0	0
Road from West Tamar to Green's Creek	10,000	0	0	599	8	0
Road from Cambridge to Bluff Ferry	2,000	0	0	60	0	0
Bridge over River Forth	2,000	0	0	1,820	0	0
Bridge over River Leven	4,000	0	0	3,500	0	0
Bridge over Prosser's River	2,000	0	0	1,950	0	0
Ulverstone Tramway	10,442	0	0	1,260	0	0
North-West Bay and Sandfly Tramway	7,584	10	0	757	0	0
Port Cygnet Tramway	4,975	15	10	3,892	16	9
Tramway leading from Southport to Port Esperance	2,552	0	0	294	4	0
Tramway leading from Port Esperance to Southport	1,914	0	0	—		
Dover and Walpole Tramway, Port Esperance	1,914	0	0	246	0	0
Franklin Tramway	5,406	0	0	284	15	0
River Cam Tramway	1,200	0	0	—		
Sorell Causeway, and previous unexpended balance	9,000	0	0	14,479	0	0
				£55,848	19	9

But that amounts to little. Some of these contracts have been abandoned, with the works to which they relate; others have only just been taken; and who can say when the whole, or even the chief part, will be completed?

Among other things less connected with the Government, or over which they could have had little control, is the departure of the troops allotted to the colony by the home Government to assist in the suppression of the war in New Zealand. They were cheerfully allowed to go, and we furnished a contingent of civilians to assist in the formation of military settlements on the representations of the New Zealand Government.

We have also been brought into connection with New Zealand in another way during the last three years. In the midst of the war in the northern island, the colonists could find time for an intercolonial exhibition in the middle island, and the Otago Exhibition was got up and proved a great success. To that we contributed our quota of exhibits, Dr. Crowther taking upon himself the labour, and much of the responsibility, of collecting and forwarding these, for which there is, we believe, a considerable balance to that gentleman still due. Our exhibits were highly spoken of there, and our exhibitors obtained from the Otago Commissioners a fair share of the awards. The Exhibition was held in 1865.

At the latter end of 1863 a new Town Hall was projected for Hobart Town, Mr. Kennerly then being Mayor, and it is to be attributed in no small degree to the interest that gentleman took in this project, that what was at first only desired has now been realised. Its erection, at a cost of £10,000 or thereabouts, took nearly two years, and it was opened with a ball to the citizens given by the present Mayor, Mr. Robert Walker, on

Tuesday, September the 25th, 1866. More than a thousand persons were present at the ball, and all went off admirably. The new Town Hall is a handsome structure, situated in Macquarie-street, near the spot on which the old Government House so long stood, and not far from the site of the new monument reared to the memory of the late Sir John Franklin.

It is not in the power of governors to do much to assist or retard the progress of a colony under a form of responsible government; but Colonel Gore Browne cannot be said to be an indifferent spectator of what is passing around him. He identifies himself with no section of the community in particular, but lets things take their own course under the direction of his Ministers for the time being. And that is all that a Governor can do politically, or, perhaps we should have said, that he ought to do. But Colonel Gore Browne is always ready to lend a helping hand towards the advancement of the social well-being of the colony, and is present at most of the meetings held for that purpose. He has now been in the colony above five years.

PART II.

A DESCRIPTIVE AND STATISTICAL SKETCH OF TASMANIA.

CLIMATE AND HEALTH.

The great salubrity of the climate of Tasmania is universally admitted. In that respect, it has the advantage, not only of the Australian mainland, but of most parts of the world. It is neither too hot in summer, nor too cold in winter, to be agreeable. At all seasons of the year, therefore, we have visitors from the other colonies, but particularly in summer.

Its geographical position is eminently favourable with regard to climate. In reference to this, Dr. Hall, long resident in Tasmania, says:—"Situated as Tasmania is, in the temperate zone, between the 40th and 44th degrees of latitude, in the Southern Pacific, with an almost boundless extent of ocean on its southern, western, and eastern aspects, and separated from the Australian continent by a wide strait; had not the island enjoyed a highly salubrious climate, it must have arisen from local causes. On the contrary, its local topography tends much to enhance its geographical advantages. The island has an undulated surface throughout; its highest mountains only attain a height exceeding 5000 feet in two instances; the country rises from all its shores gradually to its central watershed, along which is arrayed a chain of lakes that give origin to the principal rivers of the island. These rivers generally have a rapid fall, and marshes are entirely exceptional. Nevertheless, as in all islands of this configuration, there is considerable variety in the meteorological phenomena in different localities. The northern side of the colony has a warmer and moister climate than the southern, and the western has a more stormy and rainy character than the eastern shores. But, allowing for these, and differences in altitude, Hobart Town exhibits a fair climatic type for the

whole of Tasmania. There are no volcanoes, and I have never noted any symptoms of earthquakes, though others have observed slight shocks which they believed to originate in these causes."

This is from a paper drawn up by Dr. Hall at the date of the Great International Exhibition of 1862. In that paper Dr. Hall makes the meteorological tables of Mr. Francis Abbott, of Hobart Town, the groundwork of a series of climatological observations with which he follows up the foregoing. But these observations are too minute and too scientifically technical for insertion here. Further on, however, we find the following:—"During the summer months a cool south-east sea breeze may be expected to set in about 11 a.m., and is very bracing and refreshing. Sometimes it is chilling, when it suddenly overpowers an oppressive wind from the N.W., and those people grumble hard at the variable climate who do not dress judiciously. Light coloured woollen tweeds are the safest kind of garments here for all seasons. Such violent storms as I have seen in England I have never noticed here." Again:—"This climate is a decidedly breezy and invigorating one, for after the hottest day we may calculate on having a cool night, as the daily range I have before alluded to testifies."

With regard to the influence of the climate of Tasmania on health, Dr. Hall says:—"Invalids from India, China, and the hotter colonies of Australia, if not past recovery, speedily rally in Tasmania, and the increased appetite for food is the first and most surprising change. With such clear skies, abundance of ozone, bracing sea breezes, the lamp of life burns quickly, as well as brightly, and demands a much more abundant and nutritious supply of food than suffices elsewhere. Food of the best and most varied kind is plentiful, and the actual consumption per individual greatly exceeds the highest European calculations. Tasmanians spend much of their time in the open air, and many of the diseases which afflict European communities are unknown. Others have a minimum of intensity. Over-crowded, ill-ventilated, and badly-victualled ships have at different times brought to this port dangerous types of fever; but the contagious emanations arising have been speedily neutralised by the disinfecting power of our highly-ozonised air, and, beyond a few who came directly in contact with the first sufferers landed, the disease has not spread. Even eruptive fevers, scarlatina, and measles, though frequently imported, and at times severe, have speedily worn themselves out, only re-appearing at long intervals, and in mild type."

At a period antecedent to the production of Dr. Hall's paper on "Climate and Health of Tasmania," a report was brought up by a board of commissioners appointed by Sir Henry Young on the 1st of July, 1858, to consider the probable benefits which would result from the establishment of a Military Medical Sanatorium in Tasmania, which testifies to the same facts in another form. Lieutenant-Colonel R. G. Hamilton, of the Royal Engineers, was president of the Commission, and they reported as follows:—

"First.—The salubrity of the climate is equal, if not superior, to that of the healthiest part of Europe; and, for the restoration of health to those who suffer from the diseases incidental to exposure to a tropical climate, better than that of any other in the world.

"Second.—The voyage from Calcutta or Bombay to Hobart Town, in the steam vessels which carry Her Majesty's mails, would be performed in less than a month. The steamers return from Suez nearly empty. There would be good accommoda-

tion for the sick men in those vessels; an immediate change to a better climate; and a short voyage of about three weeks, instead of the long voyage of three and a half months they endure when sent to Europe.

"Third.—A sanatorium in Hobart Town, if established, would be more easily and quickly reached than the Hill Sanatoria in the Himalayas; there would be more certainty, in the generality of cases sent to it, of speedy restoration to health; and the sick and wounded men would be better housed and accommodated at Hobart Town than in the buildings set apart for them in the Hill Sanatoria.

"Fourth.—The above remarks have reference to the advantages the men would gain from the establishment of a sanatorium in Tasmania. The advantages to Government would also be great.

"Fifth.—From the large number of troops now employed, and likely to be employed for some time to come, in India, it may be expected that the casualties will be proportionably large, and there will be difficulty in filling up the vacancies in regiments as quickly as may be requisite. To perfect a soldier in drill and discipline occupies from one to four years. Many young soldiers will probably be temporarily incapacitated for further active service from wounds or disease during their first campaign in India. These disabled soldiers cannot be replaced by recruits from England under four months, and some delay must occur after the arrival of the recruit before he can become efficient for service in the field. It is a question deserving consideration, therefore, whether, at an additional cost even, it would not be advisable to allow the disabled soldier the advantages of the climate of Tasmania, as, giving him four months in this colony for the recovery of his health, he could be returned to Calcutta or Bombay in six months after quitting either of those ports, in all probability quite efficient for duty.

"Sixth.—The establishment of a sanatorium in Tasmania for 2000 men would be attended with comparatively small expense to Government, as there are already buildings either belonging to it that could be used for the accommodation of troops, or which might be hired; and building materials are easily procurable in the colony; and most advantageous sites exist in the vicinity of Hobart Town for buildings for sanatory purposes, should the Government desire to send a larger number of men.

"Seventh.—The board deem that the expense of transit to and from India to Hobart Town will be very moderate, as the voyage is short, and the steamers come down from India nearly empty."

For more detailed information on the salubrity of climate, barrack accommodation, expense of transit, and cost of rations, the Commissioners refer to the evidence taken before them, and their minute thereon. With regard to salubrity of climate, this is what their minute says:—

"From the information afforded to the Commissioners, and which is annexed, it appears that the temperature of the climate is mild; not marked by extremes of heat or cold; a winter mean temperature of Pau, and a summer temperature of Bushy Heath, near London. It is free from marsh miasma: neither intermittent nor remittent fevers occur here. Its annual fall of rain is moderate, and very generally distributed through the year.

"The rate of mortality of the troops here during fifteen years has been not quite 8 per 1000 strength; whilst the mortality in England is 33—in India, not less than 50; in China, 103. The rate of mortality among the troops in this command is less than the mortality of the civil population of England and Wales. It is shown that the troops are not injured by residence; and that the diseases most fatal to soldiers in the East Indies—those of the stomach and bowels—are those least fatal to them in this colony, and less than in the other Australian colonies.

"With these advantages there is this other important circumstance, that while an immediate return to a cold climate is likely to be injurious to persons who have resided in India and suffered from disease produced by the effects of the climate, removal to such a climate as is possessed by this colony is a course more advisable; and this is supported by the opinions of Dr. Copland and Sir James Clark.

"It also further appears, in very many instances known to the medical gentlemen who gave information to the Commissioners, that the climate of Tasmania has exercised a very beneficial effect upon invalids from India."

Colonel Crawford, now resident in Tasmania, has interested himself much in bringing the colony under the notice of retired Indian officers, among other things, on account of the salubrity of its climate.

The following, from the *Results of Meteorological Observations for Twenty Years for Hobart Town*, by Mr. F. Abbott, presented to Sir Henry Young and the Council of the Royal Society of Tasmania, January, 1861, is both interesting and valuable:—

"Weather prognostics for Hobart Town are little to be relied upon: there are no very great annual extremes in the climate, but the daily changes are sudden and frequent.

"Meteorology has scarcely any rule without an exception; and the weather phenomena here are so complicated, that little can be asserted with confidence as to the changes that are likely to take place, either from present appearances or instrumental means.

"As a general rule, the mercury in the barometer falls before rain; but in the Hobart Town records it will be found more frequently to rise with rain and fall without rain. It often falls rapidly before a strong N.W. wind, and rises as rapidly from a southerly wind; from which quarter we are pretty sure to have rain, with a rising barometer. It is also known frequently to fall rapidly and rise again without either wind or rain. In this case, it is a sure indicator of what is taking place outside the island, or in the adjoining colonies; and the next intelligence received gives some account of shipwrecks or other disasters.

"As another general rule, a diminution of temperature is usually combined with a rise, and an increase of temperature with a fall, of the barometer; but there are instances recorded where both these rules are found in fault at the same time! Not only has the barometer fallen to the amount of one inch without rain, but a simultaneous fall of the temperature has taken place at the same time, which is quite as remarkable.

"Rear-Admiral Fitzroy says, in a report published by the Board of Trade, that the barometer generally falls with a southerly, and rises with a northerly wind; in which cases the southerly wind is usually dry with fine weather, or the northerly wind violent, with rain, snow, or hail. It will be apparent that the statement here made by Admiral Fitzroy and the Hobart Town records are opposed to each other.

"A corona round the moon is significant of humidity; but for days together our atmosphere holds vapour to near saturation without rain falling. The cirro-stratus and nimbus clouds usually prognosticate rain. A cloudless night, unaccompanied with dew or small masses of cumuli, with detached fleecy clouds, betokens fine and settled weather. The beautiful cirrus clouds usually indicate approaching change, and frequently usher in strong gales."

PHYSICAL AND GENERAL ASPECTS.

It will surprise many to be told, after the lapse of upwards of sixty years since Tasmania was numbered with the rest of the British colonies, that a great part of the interior is totally unknown, and that there are other portions only partially explored. The latter is particularly the case with the greater part of the districts lying on the west coast, from which it will probably still take many years completely to lift the veil. Something might have been done towards this next spring had not Parliament been so abruptly prorogued, but it must now be deferred for another year at least.

The parts best known, however, probably give a very good idea of the whole. Mr. William Alcock Tully, deputy-surveyor, visited Mount Arrowsmith in 1859, in search for gold, and this is the description he gives of that neighbourhood:—"Forest banks, which consist of saplings and

stunted gum-trees, bound the plains; these banks stand high, and are generally stony and destitute of soil; ironstone or granite are the usual rocks. Belts of myrtle forest are also occasionally seen, with the characteristic vegetation which is invariably found with it; the darker hue of its foliage, and the depth of its shade, afford an agreeable contrast to the gayer green of the gum-trees, and the wide plains which stretch away for miles, broken here and there by a line of picturesque trees. To an artist no portion of the island affords more variety; every description of scenery abounds—from the Arcadian to the Pyrenean—and the latter in its finest and grandest aspect. I have not seen anything more magnificent than the views breaking suddenly when ascending Mount Arrowsmith; it is then the Frenchman's Tier, in its massive grandeur, first appears; it is invariably a surprise. The thoroughly Alpine character of the mountains—the rugged outline and the tortuous ravines—have a novelty which charms the eye. Looking from an elevation of 2000 feet over a valley bounded on the other side by that massive range, I do not think there can be a finer view in these colonies, and am not surprised at Sir John Franklin and his lady desiring to see this part of the island."

That has reference to a part of the island that has seldom been visited, and is not, perhaps, an overdrawn picture. But what follows has reference to more frequented portions of the island, and is written in a less ambitious strain:—"The central part of the island consists of a table land, averaging at least 3000 feet above the level of the sea—on which are seven lakes, varying in size from 2500 acres to 50,000 acres, and containing an aggregate of nearly 112,000 acres of fresh water. These lakes form the sources of many considerable rivers. The Derwent runs one hundred and twenty miles, and its estuary is navigable to and above Hobart Town, where it is two miles wide, for forty miles from the open sea. The Tamar is navigable forty miles to Launceston from the North Coast. The Huon, running a course of one hundred and ten miles, is navigable for steamers nearly thirty miles. These, and eleven other rivers, meander, summer and winter, through the mountain ranges—some of them 5000 feet high—and gently undulating hills, which intersect the island, giving an aggregate course of ever-flowing water of nine hundred miles. Thirty-one smaller rivers run for considerable portions of every year, while thousands of creeks, rivulets, streams, and springs glide, leap, and dash through the wild ravines and rocky cascades of the country in romantic variety, forming a plentiful and continuous supply of the great essential of life and health—pure water, which frequently serves to keep the face of the country fresh and green, long after those of the neighbouring colonies have been parched with drought; and affording an amount of constant motive power for mills or for irrigation, perhaps unequalled, within the same distance from the sea, in any country in the world. The bold greenstone and basaltic mountains of Tasmania—their heads for many months of the year capped with snow—form striking objects from whatever quarter the island is approached. Its undulating intervening surface, mostly covered with forests of gigantic trees extending from the hill-tops down to the water's edge, its singular intersections of land and sea, particularly about the south-eastern coast, offer to the admirer of nature's works scenery of the most wild and picturesque beauty; in lake-like bays and estuaries, fertile islands, rugged cliffs, romantic headlands, and curious peninsulas. Here and there the crops of a settler reach down almost to the water's edge, and waves carry the tidal

pulses of the vast Pacific Ocean to within fifty yards of the farm-house door."

Mr. James Smith, a gentleman long and favourably known in connection with the Press of Victoria, and now Parliamentary Librarian in that colony, paid a visit to this island in 1865, and gave us his "Impressions of Tasmania" in the shape of a lecture, which was afterwards published as a separate paper in one of the Melbourne periodicals. Mr. Smith's pen can lend a charm to whatever his eye sees, and he is equally at home in his descriptions of the people and the country. He was as much struck as most visitors are with the thoroughly English aspect of the settled districts, but has greater power over language than is usually possessed. This is a portion of his description of his trip from Launceston to Hobart Town:—"The coach was English, the pace was English, and the very inns and wayside villages were English. I almost expected to see the village-green, the worm-eaten stocks, and the waggon-headed tents of the wandering gipsies, to hear the caw of the rooks wheeling homeward from the upland fallows, and to catch a glimpse of an ivy-mantled tower peeping from its leafy covert in some sequestered nook. I don't think I should have been very much astonished if I had come upon an old English pound, with Mr. Pickwick seated upon a wheelbarrow in the middle of it, looking the picture of perplexity, and amazed at the pertinacions curiosity of the bystanders. The rosy faces of the children, too, smacked of the old country; and I missed the eager, anxious expression of countenance, and the quick, restless movements which characterise the people in Victoria. Many of the houses I passed had a square, solid, and substantial look about them, suggestive of permanence and comfort. They seemed to say, 'Look at us! we were not run up by a speculative contractor, the week before last; and we have no intention of tumbling down the week after next. We were built for use, and not for ornament. We are plain and unpretending without, but snug and commodious within. We have been occupied by the same inmates for five-and-twenty years. Healthy children have grown to maturity under these roofs; and all the tender and touching associations of home have gathered round our hospitable hearths. Too many of your people are birds of passage; but ours are attached to the nests which they have built, and in which they have reared their young.'"

Mr. Smith's description of Hobart Town itself is equally good, but we must vary our selections. This is more general:—"In describing my impressions of the landscape scenery of Tasmania, I write with a vivid recollection of some of the loveliest parts of Europe, and I do not hesitate to say that that island combines some of the most attractive features of Germany, Switzerland, and Italy. In the neighbourhood of Launceston I was constantly reminded of Tuscany. The valley of the Arno seemed to spread before me, girdled by the purple Apennines; and at Cora Linn the rushing river and the rocks tapestried with foliage brought back to mind the Via Mala and the ascent to the Splugen Pass in Switzerland. The course of the Derwent, up as far as New Norfolk, will compare favourably with a corresponding portion of the Rhine, while the dismantled fortresses and ruined towers which crown the heights of that romantic river seemed to be reproduced by the fantastic rocks and jutting knolls which flank the waters of the Derwent. Every curve of the broad stream begets a feeling of admiration and surprise. The accidents of light and shadow, varying with the position of the sun and the motion of the

clouds, impart a character of endless variety to the picture. Here the sunshine touches with a golden glow the shoulder of a mountain, and there the broad breast of one of the giants is obscured by shadow. In places the eye dwells, with a feeling of contented repose, upon a cultivated space won from the forest—a square of emerald green, or delicate yellow, set in a framework of timber, far up the mountain side. These patches of cultivation, some of them fresh from the shining ploughshare, and looking like an inlay of black marble on the slope, lend such a human interest to the solemn grandeurs and imposing forms of Nature, by linking them with thoughts of industry, of tilth and tillage, of spring-tide and harvest, of the tender blade and the golden ear, of the sanctities of home and the picturesque associations of pastoral and rural life. Then again, as the cloud-shadows drift over the mountain ranges, the effects of colour resemble those of a magnificent enamel, or the shifting hues of a shot silk. For a few seconds you see a purple island of shadow moored above a grove of forest trees, and then it goes drifting away until it is lost to view. Here the sunshine, falling obliquely through a chasm, just kindles the edges of the foliage with its vivifying light, so that the topmost branches look like plumes which have been tipped with gold. There, the receding ranges shelter in their rugged embrace valleys which the genius of a Washington Irving would transform into so many 'sleepy hollows.' As the river narrows, and you approach the rocks, you discover how lavish nature is of detail, even in those compositions where she produces her greatest effects by grandeur of outline and massiveness of material. Vertical seams and fissures break up the huge blocks of basalt into picturesque fragments; and these the benign mother has decorated with a wildly graceful, though a wayward, hand—planting a tuft of wild flowers here, and spreading a delicate tracery of lichens there; now lighting up the dark rock with a flash of brilliant colour, and anon relieving its sombre tints by the ruddy ooze of a ferruginous spring. Occasionally she seems to take a fantastic pleasure in imitating the works of man, and moulds her rugged masses into the shape of ruined bastions and crumbling walls, and cavities that bear a dim resemblance to the rock-built temples of Ellora."

This is Mr. Smith's description of the prospect from Mount Wellington:—"Of the magnificence of the prospects from Mount Wellington, we may say, as Mark Antony said of Cleopatra's beauty—

> Age cannot wither it,
> Nor custom stale its infinite variety.

The vastness of the field of vision, the lucid transparency of the atmosphere, and the interchange of mountain, valley, sea, and river, combine to fascinate your gaze at the time, and to haunt your memory for ever afterwards. And the very clouds which occasionally blur the scene confer additional beauties on it; for sometimes, as they break away to seaward, they disclose one of the islands in the estuary, so completely detached from the line of the horizon as to appear as if suspended in the heavens; and sometimes a stray sunbeam, striking on the valley of the Huon, while all around is mist and purple shadow, kindles the tract of country it illuminates into such a lustre that it appears to be absolutely transfigured, and recalls to your recollection the light which abode upon the land of Goshen when impenetrable darkness had settled upon the rest of Egypt. As it flashes in the sunlight or fades in the shadow, the Derwent gleams

like a sheet of burnished silver, or assumes the colour of a turquoise; while the undulating country inland seems to advance towards or to recede from you, according as it vividly reveals itself in the light, or grows indistinct in the transitory gloom. The city itself, sloping to the water's edge, looks like a collection of the tiniest of toy houses, dropped by a child in careless play; and the altitude at which you stand, coupled with the amazing extent of country comprehended in the view, enables you to realise the prospect visible from a balloon."

What he saw on the mountain's side is no less admirably given:—"When one explores the leafy recesses which abound on its slopes, fresh demands are made upon the admiration. Out of fairyland it would be hard to find anything more elfin and fantastic than the fern-tree coverts. The depth of shadow under the curving fronds; the silence, broken only by the chiming music of the cold transparent rill, the twitter of a bird, the hum of a wandering insect, the sullen murmur of the distant cascades, or the rustling stir of the topmost leaves of the towering trees, as the southern breeze whispers to them a message from the far-off sea; the bright green ferns, springing from the mossy trunks of the mouldering giants of the forest, turning decay into beauty, and making the graves of the mighty dead the cradles of a young life; the faint perfume of the aromatic shrubs, the grand proportions of the fallen timber, and the thick tapestry of velvet moss to which Nature, working in harmony with a foregone purpose, gives a fern-like conformation, and which yields to the pressure of the foot like a three-pile carpet—all these properties and adjuncts of the scene seem to qualify it for a region of romance."

With this we conclude, although not Mr. Smith's conclusion:—"There is a green lane at New Norfolk, than which I know of nothing more thoroughly English in the pages of Mary Russell Mitford, or on the canvas of Gainsborough, Constable, or Creswick; or in the beautiful county of Kent itself. All the elements of the picturesque are there; the lofty hedgerows, white with blossom in the spring, and crimson with berries in the autumn—the luxuriant foliage, the winding lane, the sweet breath of the new-mown hay, the sweep of the scythe through the long bush grass, and the rustic bridge spanning a brawling brook; the hop-gardens with their long-drawn aisles of vivid green, the delicate curves and spiral movements of the graceful vine, the sunshine dropping in golden rifts, and the shadows falling in dark brown lines—all hint of good old Saxon Kent; so do the gurgling runnels that wind away in the secrecy and darkness among the pollard willows until they empty their waters into a stream, cool, shadowy, transparent, and impetuous—such as Sir Humphrey Davy or Christopher North would have delighted to angle in, and old Izaak Walton would have loved to have written about."

The Tasmanians are under a deep obligation to Mr. James Smith for his attempts thus to bring into notice a country which must ever be dear to them. Will they ever have an opportunity of repaying it?

NATIVE PRODUCTS, ANIMAL AND VEGETABLE.

The natural history of the colony would be enough to fill a volume of itself. All that can be attempted here, therefore, is a mere list of its animal and vegetable products. We take the animal first, and what we

but few are peculiar to it—that is to say, not to be found in other parts of Australasia. We have eagle hawks and white hawks, pigeons and quail, parrots of all hues and every description, diamond birds and satin fly-catchers, snipe and swallows, black swans, and other land and water fowl. Snipe and quail are the only birds shot as game.

Fish is abundant in Tasmania, and the markets are well supplied with it. We have king-fish, gurnett, flounders, mullet, crayfish, and others. But the finest fish for the table is the trumpeter, commonly caught in the estuary of the Derwent and Storm Bay. But salmon and salmon trout have now been bred from English spawn in the Plenty, and have been turned into the Derwent, where we look for a large increase.

Snakes exist all over Tasmania, even on the highest mountains, and are of different species. During the first year of Sir John Franklin's administration, Lady Franklin paid nearly £700 for the destruction of snakes. Nearly 14,000 were killed. Lizards and frogs are common, but of no peculiar interest.

The domestic bee was brought over from England by Dr. T. B. Wilson in 1834, and is thriving everywhere. It is now to be found in all our forests, and has made its way to the summits of our highest mountains.

The mollusca, inhabiting the shores of Tasmania, are interesting—some of them beautiful. The fresh-water species are neither numerous nor remarkable.

On the vegetable products of the colony, chiefly its timber, we cannot do better than quote Mr. William Archer, F.L.S., who prepared a paper on this subject when the International Exhibition for 1862 was under consideration. This is Mr. Archer's paper as then published, unabridged:—

TIMBER.

The principal timber trees of Tasmania, such as the Blue Gum, Stringy Bark, White Gum, or Gum-topped Stringy Bark, Swamp Gum, and Peppermint Tree—furnish a hard, close-grained, and strong timber, which is used in ship-building and house-building, and generally for all the purposes to which Oak is applied in England. Huon Pine is very durable, and is employed for boat-building, for which it is peculiarly adapted, and for house-fittings, &c. Blackwood makes excellent naves and spokes, cask staves, &c. Native Myrtle is valuable for house-fittings. Swamp Gum yields the finest palings and other split-stuff in the world. Sassafras affords timber for house-fittings, bench-screws, lasts, &c. Celery-topped Pine is chiefly used for masts and ships' spars. The different kinds of timber in the following list are arranged according to their value. The diameter of the tree is measured at the height of four feet from the ground:—

Blue Gum.—(Eucalyptus Globulus, Lab.)—The common name is derived from the bluish-grey colour of the young plants. Diameter, 5 to 30 feet; average of those felled for use, 6 feet; height, 150 to 350 feet; sp. grav., about ·945 to 1·055. Abundant in the southern and south-western parts of the island. Cut for house-building it sells at 8s. to 10s. per 100 superficial feet—for ship-building at 12s. to 14s.

Stringy Bark.—(Eucalyptus gigantea, Hook fils.)—Common name taken from the coarse fibrous bark. Diameter, 4 to 24 feet; average of those sawn, about 5½ feet; height, 150 to 300 feet; sp. grav., about ·905. Abundant everywhere upon hilly ground. Price, the same as that of Blue Gum.

Swamp Gum.—White Gum.—(Eucalyptus viminalis, Lab.)—Common names from its growing to perfection in humid situations—and from its gigantic white trunk. Diameter, 4 to 18 feet; average, about 5¼ feet; height, 150 to 350 feet; sp. grav., about ·885. Growing in forests with other kinds of Eucalyptus, in rather humid localities. A small variety called the Manna Tree grows abundantly about Hobart Town and in other places, on dry ground.

Price, for general purposes, the same as that of Blue Gum; 5-feet palings, 6s to 8s. per 100.

GUM-TOPPED STRINGY BARK, sometimes called WHITE GUM.—(Eucalyptus gigantea, Var.)—A tree resembling the Blue Gum in foliage, with rough bark similar to Stringy Bark towards the stem. It has been found recently that this wood possesses nearly all the properties of strength, solidity, and durability of the Blue Gum, whilst, being straight-grained, it is much easier to work. It is very abundant about D'Entrecasteaux Channel. Price, about the same as Blue Gum.

PEPPERMINT TREE.—(Eucalyptus amygdalina, Lab.)—Common name from the odour of the leaves. Diameter, 3 to 8 feet; average, about 4 feet; height, 100 to 150 feet; sp. grav., about ·895. The Peppermint Tree abounds throughout the island, on gravelly and other poor soil. Price, about the same as that of Swamp Gum.

HUON PINE.—(Dacrydium Franklinii, Hook fil.)—So called because it was first discovered on the banks of the Huon River. Diameter, 3 to 8 feet; average, about 4½ feet; height, 50 to 120 feet; sp. grav., about ·650. Abundant in portions of the south-western part of the island. Price, about 16s. per 100 superficial feet, in the log.

BLACKWOOD.—(Acacia melanoxylon, Br.)—So called from the dark-brown colour of the mature wood, which becomes black when washed with lime-water. In moist shaded localities the tree grows more rapidly, and the wood is of a much lighter colour; hence this variety is called "Lightwood" in Hobart Town, to distinguish it from the other. Diameter, 1½ to 4 feet; average, about 2½ feet; height, 60 to 130 feet; sp. grav., about ·885. Found throughout the island, but not abundantly in any one locality. Price, about 12s. to 14s. per 100 feet super., in the log.

NATIVE MYRTLE.—(Fagus Cunninghamii, Hook.)—Common name, from the fancied resemblance of its dark-green leaves to those of the myrtle. Diameter, 2 to 9 feet; average, about 3½ feet; height, 60 to 180 feet; sp. grav., about ·795. The Native Myrtle exists in great abundance throughout the western half of the island, growing in forests to a great size, in humid situations. Price, about 16s. per 100 feet super., in the log.

CELERY-TOPPED PINE.—(Phillocladus rhomboidalis, Rich.)—So called from the fancied similarity in form of the upper part of the branchlets to celery. Diameter, 1¼ to 2 feet; average, about 1½ feet; height, 60 to 150 feet; sp. grav., about ·655. Rather common in damp forests in the southern parts of the island, and in some sub-alpine localities.

ORNAMENTAL WOODS.

The different kinds of wood included in the following lists are all in constant use for cabinet and fancy work. They are arranged according to their value. The finest specimens of Native Myrtle, Musk-wood, Huon Pine, and Blackwood exhibit qualities of the highest excellence, both in tint and variety of venation.

NATIVE MYRTLE.—(Fagus Cunninghamii, Hook.)

MUSK-WOOD.—(Eurybia argophyllia, Cass.)—Named from the musky odour of the plant. Diameter, 6 to 15 inches, the butt enlarging towards the ground to 1½, and even 2½ feet; height, 15 to 30 feet; sp. grav., about ·685. Abundant throughout the island in damp localities.

HUON PINE.—(Dacrydium Franklinii, Hook fils.)

BLACKWOOD.—(Acacia melanoxylon, Br.)

SHE-OAK.—(Casuarina quadrivalvis, Lab.)—A portion of the common name is evidently derived from the resemblance of the markings to those of oak; diameter, 1 to 1½ foot; height, from 20 to 30 feet; sp. grav., about ·845. Very common on dry stony hills, excepting in the north-western districts.

HE-OAK.—(Casuarina suberosa, Otto.)—Diameter, 9 to 15 inches; height, from 20 to 25 feet; sp. grav., about ·855. Common on stony hills.

HONEYSUCKLE TREE.—(Banksia Australis, Br.)—Named from the large quantity of honey in the flowers; diameter, 1½ to 2½ feet; height, 20 to 40 feet; sp. grav., about ·645. Abundant on sandy soils.

DOGWOOD.—(Bedfordia salicina, D.C.)—Diameter, 6 to 16 inches; height, 15 to 25 feet; sp. grav., about ·985. Common of small size, but rare of large proportions.

NATIVE LAUREL.—(Anopterus glandulosus, Lab.)—So named from its laurel-like

leaves; diameter, 6 to 10 inches; height, 15 to 22 feet; sp. grav., about ·675. Tolerably abundant in some sub-alpine localities.

BLUE GUM.—(Eucalyptus globulus, Lab.)—Curly-grained variety.

PEPPERMINT.—(Eucalyptus amygdalina, Lab.)—Some specimens of this timber have a fine wavy marking.

USEFUL WOODS.

SILVER WATTLE.—(Acacia dealbata, Lindl.)—So-called from the whiteness of the trunk and the silvery green of the foliage; used for cask staves and trenails; diameter, 1½ to 2½ feet; height, 60 to 120 feet; sp. grav., about ·965. Very common.

IRONWOOD (Tasmanian).—(Notelœa ligustrina, Vent.)—An exceedingly hard close-grained wood, used for mallets, sheaves of blocks, turnery, &c.; diameter, 9 to 18 inches; height, 20 to 35 feet; sp. grav., about ·965. Not uncommon.

SWAMP TEA-TREE.—(Melaleuca ericæfolia, Sm.)—So called, probably, because the leaves of an allied plant (Leptospermum lanigerum, Sm.) with similar bark are said to have been used as a substitute for tea; diameter, 9 to 20 inches; height, 20 to 60 feet; sp. grav., about ·824. Used for turnery chiefly.

NATIVE CHERRY.—(Exocarpus cupressiformis, Lab.)—So named because the colour of the fruit is similar to that of a Kentish cherry; diameter, 9 to 15 inches; height, 20 to 30 feet; sp. grav., about ·785. Used for tool-handles, spokes, gunstocks, &c.

WHITE-WOOD.—(Pittosporum bicolour, Hook.)—Wood white; diameter, 8 to 13 inches; height, 20 to 35 feet; sp. grav., about ·875. Used in turnery; probably fit for wood engraving.

NATIVE BOX.—(Bursaria spinosa, Cav.)—The leaves are somewhat like those of the English box; diameter, 8 to 12 inches; height, 15 to 25 feet; sp. grav., about ·825. Used for turnery.*

PINK-WOOD.—(Beyeria viscosa; Croton viscosum, Lab.)—Diameter, 8 to 10 inches; height, 15 to 25 feet; sp. grav., about ·815. Used for sheaves of blocks, and for turnery.

NATIVE PEAR.—(Hakea lissosperma, Br.)—The woody seed-vessel is somewhat pear-shaped. Diameter, 8 to 12 inches; height, 29 to 30 feet; sp. grav., about ·675. Fit for turnery.

SCENTED WOODS.

TONGA BEAN WOOD.—(Alyxia buxifolia, Br.)—The odour is similar to that of the Tonga Bean (Dipteryx odorata). A straggling sea-side shrub, 3 to 5 inches in diameter.

NATIVE BOX.—(Bursaria spinosa, Cav.)—The scent is pleasant, but fleeting.

TANNING BARK.

WATTLE BARK.—The bark of the Black Wattle (Acacia mollissima, Willd.), the Silver Wattle (Acacia dealbata, Lindl.), and the Blackwood Tree (Acacia melanoxylon, Br.). The first-named yields the most valuable bark, and is common on dry stony hills.

FIBRES.

CURRAJONG.—(Plagianthus sidoides, Hook.)—The fibres of the bark are very strong. It is a large shrub, found chiefly on the southern side of the island, in ravines and shady places, and grows rapidly.

LYONSIA.—(Lyonsia straminea, Br.)—Fibres of the bark fine and strong. The Lyonsia is met with rather sparingly in dense thickets, with its stems hanging like ropes among the trees.

BLUE GUM.—(Eucalyptus globulus, Lab.)—The bark of this immense tree yields a fibre which may probably be found available for making the coarser kinds of paper.

STRINGY BARK.—(Eucalyptus gigantea, Hook fil.)—The fibres of the bark are similar to those of the Blue Gum bark, but are not so strong, nor so fine.

FIBROUS GRASS.—(Stipa semi-barbata, Br.)—After the seed has ripened, the upper part of the stem breaks up into fibre, which curls loosely and hangs down, waving in the wind. The condition of the fibre at this time is undoubtedly far inferior to what it would be if rightly prepared. Common in some localities.

GUM.

KINO.—This gum, which seems to have similar properties to those of the East Indian "kino," exudes from the woods of all the Tasmanian species of Eucalyptus.

WATTLE GUM, the gum of the Silver Wattle (Acacia dealbata, Lindl.), is exceedingly viscous, and probably quite as useful as gum arabic. The gum of the Black Wattle (Acacia mollissima, Willd.), which is often mixed with the other, is very inferior to it, being far less viscous.

SUNDRY PRODUCTS.

PRICKLY FERN TREE.—(Alsophila Australis, Br.)—This very handsome Fern Tree occasionally attains a height of 30 feet. It is not by any means so common a Fern Tree as Dicksonia antarctica (Lab.).

PITH OF RUSHES.—This is the pith of the largest Tasmanian rush (Juncus vaginatus, Br.). It is not rare. This pith is made up in Hobart Town into head-dresses.

GELATINOUS SEAWEED.—(Gracilaria sp.)—This Alga, which may perhaps be regarded as a variety of G. confervoides (Grev.), is occasionally used for making jelly. It abounds on the shores of Sloping (or Slopen) Island, in Frederick Hendrick Bay.

NATIVE BREAD.—(Mylitta Australis, Berk.)—An insipid under-ground fungus, which sends up no stem, and is generally met with by accident. When growing rapidly it sometimes causes the ground to crack, and may thus be discovered by a careful observer, as it probably was by the aborigines, who used it as food.

METALS, MINES, AND MINERALS.

GOLD.

As in most other countries, gold is pretty generally diffused over Tasmania, but it has not yet been found in large paying quantities, as in Victoria and New South Wales. Still it has been found in considerable quantities about Fingal, and quartz-crushing companies have been formed within the last twelve or eighteen months to work some of the gold-bearing quartz reefs. The Fingal Quartz Crushing Company, the Alliance, and the Union are the principal, and the accounts from these, although not in the highest degree flattering, are good. Companies have been formed in Victoria and New South Wales, without number, to work the gold-bearing quartz reefs there with fewer prospects of success. But the general belief is that gold must be sought for on the western side of the island, and not on the eastern, where Fingal is, if it is to be found in paying quantities, and that belief is daily being strengthened.

Several things have contributed to this. About a year and a half ago, Mr. Hargreaves was sent for from New South Wales to search for gold in this island, and his visit, although comparatively abortive, as most people expected, had the effect of turning attention to what had been previously said of the probable existence of gold on the western and north-western side of the island. Mr. Emmett, of Circular Head, has since made a visit to the Hellyer, and procured black sand from the bed of the river, in which particles of gold are distinctly visible to the naked eye, and which resembles that in all respects in which so much gold has been found in New Zealand. These things combined have awakened attention to what has before been said of the existence of gold on the western side of the island, and which shall here be reproduced in a condensed form.

On the discovery of the New South Wales goldfields in 1851, the Rev. W. B. Clarke, of Sydney, wrote to Sir William Denison, then Governor of

Tasmania, expressing an opinion that gold-bearing rocks would some day be found in Victoria and Tasmania, in nearly the same parallel of longitude as that on which it had been found in New South Wales. It was shortly afterwards so found in Victoria, namely, at Ballarat, and an award of £1000 was made to Mr. Clarke for his services in calling attention to this. In 1859, an association of gentlemen, consisting of Messrs. T. D. Chapman, G. Stevenson, F. A. Downing, J. Forster, and others, agreed to send out Mr. Tully, deputy-surveyor, to search for gold in the neighbourhood of the Frenchman's Cap, that being thought to be sufficiently near the spot indicated by the Rev. Mr. Clarke in his communications to Sir William Denison in June, 1851. Mr. Tully's expedition was not a successful one, but it never satisfied the gentlemen by whom he was sent out that gold was not to be found in paying quantities in the regions to which he had been sent, nor did it satisfy the general public.

Mr. Tully's report to the gentlemen who sent him out is dated April, 1859, and we take from it one or two extracts. This is the first :—

"I divided the four men who accompanied me to the westward into two parties, one of whom I forwarded to the Frenchman's Cap, and the other to Painter's Plains. I was led to select the latter place for trial in consequence of granite cropping out in boulders, and extending along one side of the valley.

"The other party had instructions to sink and prospect a large drift immediately between the Frenchman and a ridge of the Brown Mountain formed by block slate, and veined with undoubted auriferous quartz. I have had great hopes that gold might be found in this drift should we be successful in sinking a shaft; from its position the deposit has evidently been derived from a double source—viz., the Frenchman, and the ridge mentioned above.

"We did succeed here in bottoming a hole, which cost the men who were engaged in it a large amount of labour. I almost felt an assurance of finding gold at the bottom ; the washing dirt was of a reddish hue, and resembled closely the same description of stuff in Victoria. I washed every portion of it myself, and saved the small fragments of quartz which I found dispersed through it for testing purposes. I am confident that if gold existed in this part of the country some would have been found in this shaft, for no place could have been selected more suitable for trial. The stratum of this drift is nearly uniform, consisting of clay mixed with quartz boulders, and angular pieces of the same, cemented by cakes of a burnt texture arising from depositions of iron which had spread by oxidation."

Again, Mr. Tully says :—

"In conclusion, although I regret, for my own sake as well as for those who defrayed the cost of the expedition, that the search was unsuccessful, yet I do not think the money was ill spent ; it will set at rest the long-cherished hopes of the existence of a goldfield in the neighbourhood of the Frenchman's Cap; and by drawing the attention from that quarter may direct it to localities further north, which have never been thoroughly explored, but which possess the most favourable indications of the existence of gold."

This report was submitted to the Rev. Mr. Clarke for his opinion, and some of his remarks upon it were as follows :—

"The first notice which I took of the region in question was in the month of June, 1851, when I addressed a letter to His Excellency Sir W. Denison; and about the same time made mention of it in a pamphlet published in Sydney, on the 'Discovery and Working of Gold in Australia.' By reference to that pamphlet (pp. 11-13) you will find that I was discussing, not the question of alluvial gold, but of gold-bearing rocks ; and, in relation to the manner in which such rocks are found in Australasia, I made use of these expressions :—'Thus then, in Australia, though the direction of the predominant ridge is curvilinear, there may be a recurrence of certain formations on different meridians parallel to each other; and thus the very same rocks that are found fertile in metals along the 149th meridian, may also be found fertile on the 152nd, and thus gold also ought to be found, if

at all, in the province of Victoria between 143° and 145° E. north and south of 37° S. lat., and in Tasmania in 146° and 42° S.'

"That I was not mistaken in one of these indications has since been verified by the discoveries of the gold-bearing rocks of Mount Alexander and Ballarat, of which the discoverer of the deposits in the latter district confessed that he was induced to seek for them in consequence of what I had previously written on the subject.

"If I read Mr. Tully's report aright I think he has afforded a testimony to the accuracy of my indication, which confirms rather than denies the truthfulness of the opinion which I had been led to form as to the existence of gold on the meridian indicated. But that gentleman has somewhat misunderstood me in one point where he speaks of my 'authoritative assumption of the existence of gold at any dividing range near the intersection of longitude 146° with the 42nd parallel of south latitude.' Of course I did not mean to speak of any dividing range irrespective of rocks which form it. Now, regarding all that had been made out as to the existence of such rocks in that quarter, combined with their 'strike,' and what I had been given to understand was the actual condition of the natural sections where such were to be seen, I certainly did consider that, although much more elevated than the country in Victoria between 143° and 145° E., there were sufficient indications of the existence of gold in the rocks to bear out the propriety of pointing to that part of Tasmania as the likeliest region for anticipating the occurrence of gold.

"Mr. Tully mentions several spots where he was reminded of auriferous localities in Victoria; and gives such a description of one in particular as would lead even a gold-digger to anticipate success. 'The washing dirt was of a reddish hue, and resembled closely the same description of stuff in Victoria.' Near the same locality he says the slates were 'seamed with undoubted auriferous quartz.' Again, he mentions the quartz of Mount Arrowsmith as having the appearance of being auriferous. Certainly, therefore, my own opinion formed on other grounds, and the opinion of Count Strzelecki, which was published after mine, have been justified by Mr. Tully's observations.

"Further, the samples of quartz previously collected by Mr. Calder and others which were sent to me, and were subjected to careful examination and amalgamation by Mr. C. J. Hodgson, then of Sydney, now of Melbourne, and of which my report of 27th September, 1856, gives the results, undoubtedly proved, that not only is there 'appearance' of auriferous value, but the existence of gold in the quartz from Frenchman's Cap and Mount Arrowsmith, as well as from intermediate and neighbouring localities."

Nothing more was done that year, nor the next. But in 1861, Mr. Gould, the Government geologist, was sent to explore the neighbourhood of Macquarie Harbour, a little more to the southward, and found traces of gold everywhere, particularly in the Gordon, the Franklin, and the King's River, and reports on it to the Government thus:—

"I think we may fairly assume the desirability of further investigating the western country; but how, and by whom, it can be done most effectually, is a broad question for legislative consideration, on which I can only offer a few suggestions—such, in fact, as might be made by any other person who had possessed the same advantages of visiting it.

"The very considerable extent to which the Gordon river is navigable renders that one of the most important routes of access; a small craft being able to ascend, without danger, to within a mile and a half of the junction of the Franklin river, while a boat can be easily taken considerably beyond that point. As, moreover, a good road exists *via* Hamilton to the Great Bend of the Gordon, and the line of country existing between that point and the highest point of navigation upon that river appears for the most part to be, although broken, free from scrub, it would seem desirable to connect them by means of a track, available at least for pack horses, which would present the advantage of traversing the strike of all the formation, while by it provisions might be readily carried into any part of the country which upon further investigation should appear to be the probably original site of the drift gold collected lower down.

"The examination of the valley of the Franklin river could be most conveniently effected by working upwards from its junction with the Gordon, which is within a few miles of a spot where a provision depôt could be permanently established.

"Similarly, the drift gold already discovered in the King's river could be most effectually traced by following it up from the harbour. In the two latter instances, a necessary preliminary would be the cutting tracks up the courses of the river for the purpose of maintaining supplies. Mature consideration will be requisite to determine whether, after facilities of communication have been thus provided, the practical exploration of the country should be left entirely to private enterprise or undertaken wholly or in part by the Government. For as, even in well-determined auriferous districts, the slightest discouragement is frequently sufficient to deter and send away a large proportion of prospectors, it is questionable whether men of energy, determination, and patience will be found in sufficient numbers to fairly test the value of a country presenting extraordinary difficulties; or rather, whether men, possessing those valuable qualities, would be willing to devote their time and capital without some more substantial return in view than is afforded by the speculative riches of an undeveloped goldfield, and this the more especially as the locality, extent, and richness of the auriferous rocks have yet to be determined; and great results, though possible, cannot be immediately anticipated, since even a superficial examination of the western country can hardly be effected in less than several years, upon account of the difficulties in traversing it, which are enhanced by the peculiarities of the climate.

"Upon the other hand, it must be remembered that, even under the closest supervision, mere paid employés rarely work so thoroughly and energetically as those who, depending on their own resources, and determined by their own free will, are stimulated by well-founded anticipations of success. Whether the further examination of the country traversed by the Gordon river, which I should recommend to be made during the early spring, will warrant such anticipations being held out, remains to be seen. At present, it would be uncandid to do so, the sum of our information being the knowledge of the existence of drift gold in small quantities in lower parts of rivers flowing from a country unexplored, but known to be in part occupied by Silurian rocks, and there being strong grounds for believing it to be entirely so. This, while sufficiently encouraging to a nation to make further investigation, is, as yet, insufficiently so to the individual to make me advise great sacrifices of capital or time."

The necessities of the Government alone have precluded the further search for gold in that direction from that day to this. But Mr. Emmett's discovery of auriferous black sand in the Hellyer, farther to the northward, would have led to a renewed application to the Government for assistance last session, had not Parliament been so abruptly, and to some unexpectedly, closed. But the matter has only been deferred a little. It will be taken up again when the new Parliament meets.

IRON AND IRON ORES.

It has long been known that iron in almost a pure metallic state exists in different parts of the island, and that iron ores are abundant, particularly in the north. So far back as 1823, Mr. Commissioner Bigge reported to the House of Commons on the iron ore of Ilfracombe, in the West Tamar district, as follows:—"At the distance of eight miles from Port Dalrymple, the Tamar, in Van Diemen's Land, considerable quantities of iron ore have been discovered on the surface, which upon analysis in this country have been found to consist of pure protoxide of iron, similar to the black iron ore of Sweden, and furnishing a very pure and malleable metal." But Mr. Gould, the Government geologist, has lately been exploring that region more fully, and made a report to Parliament last session on the subject at length. He says:—"There are four varieties—the principal are earthen-brown hematite, crystallised-brown hematite, and magnetic oxide; the other, which is earthy-red hematite, is of more sparing occurrence, and is evidently a mere derivative from the previous ores. Unlike other iron ores which I have observed in many parts of the colony, and which consist merely of hematites formed by the deposition

of ferruginous matter from rocks containing a small percentage of iron as an element of composition, these appear to be contained in real mineral lodes, or to be derived from the contents of such, and their formation appears to have been determined by a mineral force acting in defined directions."

Mr. Gould's description of the position, quality, and quantity of the first of these descriptions of ore, having regard to a map of the locality with which his report is accompanied, is as follows:—

"The point illustrated is about seven miles from the beach, along the now disused tramway formerly belonging to the Ilfracombe Saw Mill Company.

"To the west of the small creek indicated on the chart the ground is level, alluvial, and therefore exhibiting no traces of the probably underlying lode.

"To the east the ground rises at first gradually, and afterwards more steeply, until a maximum angle of elevation of about 20° is reached near the summit of the ridge, which is itself merely an offset spur from the conspicuous and elevated mountain known as the Sugar-Loaf.

"The ore is exhibited in boulder-like masses, strewing the surface or imbedded in the ground, and may be traced along the surface for a distance of nearly 300 yards, corresponding to 286 in plan. The width of the deposit has been laid down upon the chart as accurately as it was possible without undertaking mining operations. At various points there are apparently offsetting veins, and towards the upper end appearances favour the conclusion that the vein is difurcating, and splitting into strings.

"The ore is of greatest excellence in the lower ground, that at the extreme upper end being inferior in richness and not quite so abundant in quantity. The ore shows itself to be of good quality, however, for more than one-half of the length of the reef, and even the remainder is at least equal to much of the iron ores smelted in other countries. The general direction is about 30° W. of S. and S. of W.; the average width about 66 feet, the length outcropping 300 yards, and the average slope about 14°.

"Taking a rough estimate, this gives the cubic contents of the portion of the vein above the water level at about 705,800 tons. Assuming that only one-half of this is rich ore—and I consider this to be an estimate below rather than over the mark—we have an amount of 350,000 tons of rich ore lying above the water level, and presenting every facility for being quarried in stopes at an exceedingly low rate per ton, the other moiety presenting equal facilities of working; while every yard in depth below the water level would yield, on the same calculation, 20,458 tons, without taking into consideration the extension of the lode westward, which would largely augment it. The ore contained in this lode is brown hematite; it presents all the usual variations of the ore in different parts of it; at one place it is compact and massive, at another crystalline, in reniform and botryoidal masses, with a fibrous and radiated structure. It will probably average from 55 to 60 per cent. over a large portion of the lode. It stands out from the surface in weathered blocks, and towards the upper end detached masses of immense size occur. The largest of these blocks has the following dimensions:—12 feet in height, 22 feet in length, and 15 feet broad. In this the ore alternates in thin layers of from a quarter to half an inch in thickness, with ferruginous sand, and the layers have a somewhat wavy structure, so that the whole has a distant resemblance to one of the foliated rocks; even here, however, there is perfect crystallisation at intervals."

Of the best mode of turning these deposits to account, Mr. Gould speaks thus:—

"In the absence of coal in the district, it is desirable to consider the possibility of exporting the ore to coal in this or adjoining colonies. With regard to this colony our attention must be limited to those localities within easy access by water carriage, which reduces the consideration to the various districts upon the north coast, where the presence of coal has been determined, and less immediately on account of distance to the coalfields on the east and south of the island.

"The amount of coal-containing country on the north coast is very con-

siderable, but the seam is thin, and at present only worked in one locality in the neighbourhood of the Don. A market value would at once bring all this coal into production. The formation extends from the Mersey westwards as far as or beyond the Forth, a few miles up which river coal is reported to crop. I have not visited the locality, my previous report having only extended to the Mersey and the Don. In the Seymour coalfields the thickness of the seam is much more considerable; and it may be well for those who are commercially interested in that company to determine on their own account whether the coal is suitable for iron-smelting purposes. With regard to the second branch of the subject—the question of the production of malleable iron by a direct process from the ore by means of charcoal—this is one which may well engage the attention of those who are interested in obtaining chemical products from the distillation of our woods by a process which leaves a large amount of charcoal as a by-product to be disposed of. It would at least be worth calculating whether the advantages afforded by the existence of rich ore in large quantities, readily worked, and of easy access, may not be set against the sole drawback—viz., dearness of labour—where the large additional advantage of very cheap fuel is created.

"Let the question be determined how it may for the present, I feel confident at least of this—that at no very distant period the district in which iron ore of such quality, abundance, and favourable position occurs must become one of the most important in the colony. There are other results arising from the survey of this district which will probably materially affect a large portion of it. The rocks described as belonging to the lower Silurian formation possess the additional interest of corresponding very closely with those which form a large proportion of Western Tasmania. Here they may be studied with a degree of attention which the nature of the country prohibits in that wild and unsettled region."

COALFIELDS.

Coal exists in most parts of Tasmania, east, west, north, and south. Until lately, Hobart Town was chiefly supplied from the mines at New Town, a distance of about three miles from the city, and from Tasman's Peninsula. But the Seymour Coal Mining Company now takes its fair share of the trade, and the mines of this company are on the eastern coast. From New Town and Tasman's Peninsula we get anthracite coal; from Port Seymour, bituminous. But it is generally believed that coal-beds of far greater value than these exist in other parts of the island, and Mount Nicholas has long been pointed to as the site of one. Of this, the following notice appears in an account of the samples of coal furnished for the International Exhibition of 1862:—

"The seam of coal which crops out at various points on the side of Mount Nicholas, locally known as the Killymoon seam, overhanging Break-o'-Day Plains, at a height of about 500 feet—can be worked at an adit level, is distant nine miles from the port of Falmouth, is highly bituminous, and it is believed is well suited for steam, gas, and domestic purposes. The same seam crops out near Fingal and at various other parts, but the main seam is that now illustrated by samples from different portions of it. This coal-bed is estimated to occupy an area of about fourteen square miles, on the northern side of the Break-o'-Day Plains. Various other portions of the bed are equally accessible, but although they are mostly bituminous, they are inferior in thickness to the Killymoon seam."

From the same source we derive the following:—

"Beds in the Mersey river have also been found, and, although limited in quantity, have been profitably worked, as they are easy of access. The coal is very bituminous, is used by the coasting steamers and in Launceston, and has been recently exported to Victoria. The bituminous coal from Hamilton is said to be very good. It lies about forty feet deep, in a seam 4 feet 6 inches thick, and has been used, and favourably reported on, by the Derwent steamers, from the shipping place of which, at New Norfolk, it is about twenty miles distant. The coal formation on the south side of the island extends round the mouth of the Huon to

S. W. Cape, within which range many deposits have been discovered. With a supply so varied and extensive, some localities will probably be soon found to possess coal of first-rate character, easy of access."

OTHER DEPOSITS AND FORMATIONS.

Galena, or lead ore, has been found in different parts of the colony, but not in any great quantity. Copper ore is more abundant, particularly on the northern side of the island. In reference to these, Mr. Gould speaks in the report already quoted from thus :—

"Upon the north coast, promising strings of copper and lead ore occur in combination. I have not studied the locality, but believe the formation to be part of the series to which those above described belong; while, in the equivalent limestone, lead and traces of copper have been found in other parts of the colony. This appears, then, to be the formation which should be especially regarded by those searching for mineral deposits in this country."

Marbles of a superior quality exist in various parts of the island, particularly in the Florentine valley. Building stone abounds in all directions. The new Melbourne Post Office drew its chief supply from us. At Port Seymour, the best description of fire-clay is found, and fire-bricks are being manufactured from it, and sent to the other colonies.

THE ABORIGINES.

A brief sketch of the aborigines of Tasmania was prepared by the writer of the foregoing for transmission to England in the month of October, 1862, and there is really little or nothing to be added to that since. The aborigines of this colony were then reduced from a once large and powerful body to one male and three females. That one male is no longer in the colony, but has taken to a seafaring life. One of the females has also since been married. In other respects there is nothing to be added to what was written in October, 1862, which was as follows :—

At the last ball at Government House, Hobart Town, there appeared the last male aboriginal inhabitant of Tasmania. We had read much before of the 'Last Man,' and heard much of the last man of his race, but had never expected to have been favoured with a sight of such a person. In this case, indeed, the person in question was accompanied by three aboriginal females, the sole living representatives of the race besides himself, but not of such an age, or such an appearance, as to justify the expectation of any future addition to their number. We may, therefore, look upon this individual, not only as the last man of his race *in esse*, but also *in posse*.

In this, there is something very serious, if not very affecting. If we are to receive in its strict literal acceptation what we read in holy writ of God's having made of one blood all nations of men that dwell on the face of the earth, and of His having determined the times before appointed and the bounds of their habitation; the blotting out of an orb from the starry sphere that rolls over our heads would involve no such consequences as the blotting out of a race of men. And yet, where the white man has been brought into contact with those of another hue, there is too much truth in what has sometimes been alleged, that his shadow has appeared, as if by an ordained law of Heaven, to be the shadow of death to all others. In all his attempts to civilise the aboriginal races of other countries of a different hue, the white man has found them melting away before him as snow before a summer's sun. What was to have exalted them has tended to their

debasement. What was to have been a source of prolonged life to them as a people has led to their speedier extinction.

That has been strikingly illustrated in the history of the aborigines of this country, so far as it can be traced. From their first contact with the whites, until their final separation, the tendency was downwards, and it was then too late to arrest the progress in that direction. It is not in human nature to be recuperative beyond a certain point. We sometimes speak of savage life with feelings bordering on contempt, but it is quite possible for born and bred savages to be made worse than savages by those who boast of an advanced civilisation. In their attempts to exorcise the demon of savage life, those who boast of an advanced civilisation not unfrequently make the savage two-fold more a child of hell than he was before. Of this there has been no want of proof in any of the attempts at modern colonisation, but it has been pre-eminently the case here. We wish to draw no picture not warranted by facts, or not susceptible of verification even to the minutest details. It is not possible for us to go much into detail here, but we wish it to be distinctly understood that we write in the light of well-ascertained facts, now upon record, and which can be produced, if required. With less than this we should scarcely be justified, perhaps, in the tone we have assumed.

We can do no more here than give a rapid sketch of the history of this race of people from the time the white man was first brought into contact with them down to the present, interspersed with an occasional remark or two of a more general nature, in justification of the position we have already taken up. Their number in the first decade of the present century has been variously estimated. By some, they were estimated at 7000. But others set them down at 4000 to 5000 only. In the judgment of charity, and in consideration of the fact that we are now in the presence of the last man, let us take them at the smaller of these two numbers. The gulf to be bridged over is still wide enough, and there would be plenty of room for horrifying details between the extremities of the span, if our space admitted of these. But by what means has this process of extinction been carried on? At first, the aboriginal inhabitants of Tasmania are said to have been harmless enough, but this did not protect them from maltreatment by the whites. So early as 1810, Governor Collins had to complain of this, and issued an order to the effect that any person detected in firing wantonly on the natives, or murdering them "in cold blood," should suffer the extreme penalties of the law. And yet lesser offences against them were very leniently dealt with during Governor Collins's time. One man, for instance, was merely flogged for exposing the ears of a boy he had mutilated, and another for cutting off the little finger of a native and using it as a tobacco stopper. Colonel Davey and Colonel Sorell, Governor Collins's successors, after a brief interval, the former from 1813 to 1817, and the latter from 1817 to 1824, seem to have had the same ground of complaint against the whites for their maltreatment of the natives, and during their governorships we meet with many a sad and mournful tale. In Governor Davey's time the practice of firing on the natives was common, and in Governor Sorell's the children of the natives were stolen with impunity, and their women treated most shamefully by lewd fellows of the baser sort. One of these ruffians boasted of having captured a native woman, whose husband he had killed, and of having strung the bleeding head to her neck, and driven her before

him as his prize. Nor is there any reason to doubt that this monster in human shape did what he alleged. It was not mere brutal gasconade.

On Colonel Arthur's assumption of the office of governor in 1824, things were not much better. They were, in fact, if anything, rather worse, and so they continued for a time. We do not wish to conceal the fact that the natives had for some years past been the perpetrators of the most astounding atrocities. That is admitted on all hands. But most of these atrocities were to be traced to a spirit of retaliation and revenge. The natives were not only goaded to madness by the treatment they themselves met with, but by the brutal conduct with which their women and children were treated by the depraved whites. Things had thus come to such a pass on both sides as to render it necessary that some decided step should be taken on the part of the Government and the settlers, and this lands us in that portion of the history of the decadence of this unfortunate race of people, which partakes almost as much of the character of the ludicrous as it does of the horrifying. Governor Arthur conceived the bold design of making war upon the natives, but he hardly acted, we think, in a spirit of fairness in making it a *sine qua non* that his intention of doing this should be carefully concealed from them. This is not in accordance with the usages of modern warfare. But then they were savages, and were to be captured, and not slain, if the latter could be avoided. The plea for this war was, that all attempts to "tame," not civilise them, had failed, and that there was no safety for life or property so long as they were allowed to be at large. It would be too long a story to go through all the preparations for this campaign, or even to hint at the mode in which it was conducted. All the settlers were required to turn out on the 1st of October, 1830, and every part of the island was invested. The force on our side consisted of nearly 5000 men, well armed, and that of the unsuspecting natives of not more than 1500 to 2000, including their women and children, with no other arms than their spears and waddies. To so small a number had the natives now been reduced by their intercourse with the settlers. Thousands of muskets had been charged from time to time for their destruction, and had effected their deadly purpose. Governor Arthur put on a face of becoming gravity for the campaign, and the parties engaged in it dignified it with the name of the "black war." The natives were, if possible, to have been driven into Tasman's Peninsula *en masse*. But the thing turned out a complete failure. Hundreds of recruits "crawled away home" before the campaign was half over, although it did not last much more than a month, and the Governor himself was "lost three days in Paradise"—not the Edenic Paradise, but a colonial one—when his services were most needed. At length it had to be given up with two natives captured, and one soldier wounded, as its only results.

Nothing dismayed, however, it was now determined to effect by strategy what could not be done in the open field, and a very fitting agent for this was found in the person of Mr. Robinson, who was afterwards appointed to the office of Protector of Aborigines. There are various opinions as to the fitness of this gentleman for his office, but there can be no doubt whatever as to his having been a man of great daring, or as to his success in carrying out the views of the Government of the day. He was appointed in 1829 to take charge of some natives in Bruni Island then captured, and from them he acquired a partial knowledge

of the native language. His business, after the "black war" was over, was to take them by guile—to capture them, as he expressed it, "by the withdrawal of intimidation, and the employment of persuasion only"—and whether he acted up to this system or not throughout, he certainly succeeded to admiration. At this work he continued for a number of years, and the last batch of natives was captured, after he had left the colony, at Circular Head, and were conveyed to Flinders Island, the place that had been determined upon in the interim for the reception of the rest, and where they were already provided for by the Government. At the beginning of Mr. Robinson's mission it was estimated that there were about 700 at large—showing what havoc had been made of them from 1810, when their number on the lowest computation was between 4000 and 5000, and 1860, that is to say a period of twenty years—but it must not be supposed that Mr. Robinson captured any such number as 700—numbers of them having perished in different parts of the colony between 1830 and 1842. As to the policy of their being couped up in a small island, serious doubts were entertained from the first, and it was confidently asserted by many, as the event has proved, that that island would shortly be their grave. But it is no part of our object on the present occasion to discuss the policy of this, or any other portion of the conduct of the Government, with regard to the natives. We have had too much to do with facts to leave room for anything else.

As we started, so we desire to close, with a bare reference to the fact, that the Tasmanian natives, as a race, are now virtually extinct. There is only one man left. With whom does the blame of this rest? Most assuredly, not altogether with the natives themselves. No one can say with truth, that they were not as much sinned against as sinning, in the disasters that befel them. But they are gone, and their extinction, as a race, was probably as inevitable as it is inscrutable. As savages they were found, as savages they lived, and as savages they perished? Such an event is not one of everyday occurrence. It is, therefore, deserving of some such formal notice as this. But who pretends to understand it? Who would undertake to assign the reasons for it?

PASTORAL, AGRICULTURAL, AND COMMERCIAL.

LIVE STOCK.

Upwards of sixty years have passed since Colonel Collins introduced a few cattle from Bengal, and a few horses and sheep from New South Wales. How they increased, and how the different breeds have been improved from time to time, has been already described. Their present number is as follows:—

RETURN OF LIVE STOCK IN 1864 AND 1865.

Description.	1864.	1865.
Horses	22,090	22,152
Horned Cattle	89,801	90,020
Sheep	1,736,540	1,752,719
Goats	2,393	2,410
Pigs	50,380	36,624

That gives the return for two years only, and the increase for that period is slight. Indeed, upon this and some other matters, the tendency

has rather been downwards than upwards since Tasmania was declared a free colony. So many were at that time attracted to the other colonies as to have made labour scarce, and that has also been felt in other departments of rural affairs as well as in the breeding and rearing of stock.

AGRICULTURE.

At one time Tasmania was the granary of the south. She supplied South Australia, New South Wales, and Victoria with a great portion of their supplies. But it is no longer so. We barely produce sufficient for our own consumption, taking both ends of the island together. In the north, they produce more than they consume; in the south, less. The following is a return of our crops for 1865:—

AGRICULTURAL AND HORTICULTURAL RETURNS FOR 1865.

Description.	Acreage.	Quantity.
Wheat	73,270	1,273,766 bushels.
Barley	4,527	101,504 ,,
Oats	28,538	688,740 ,,
Peas	3,146	62,766 ,,
Beans	499	11,589 ,,
Potatoes	10,270	41,864 tons.
Turnips	2,071	11,740 ,,
English grass	5,223	66,418 bushels.
Tares	296	3,812 ,,
Carrots	136	1,252 tons.
Onions	202	952 ,,
Colonial hay	30,244	34,751 ,,
Mangold wurtzel	934	9,058 ,,
Tobacco	156	388,065 lbs.
Apples	—	160,992 bushels.
Pears	—	13,828 ,,

There was a considerable increase on the wheat, both in acreage and yield, last year, as compared with 1864. The land under wheat in 1864 was 60,186 acres, and the yield 839,501 bushels. But in 1865 the land under wheat was 73,270 acres, and the yield 1,273,766 bushels. There was also a considerable increase on potatoes and English grasses. But there is still room for improvement, and all ardently desire it.

IMPORTS AND EXPORTS.

The present state of our commerce must be gathered from the last Customs and shipping returns. The following are the totals of our imports and exports for the two years:—

IMPORTS AND EXPORTS FOR 1864 AND 1865.

IMPORTS.

Port.	1864.	1865.
Launceston	£549,015	£437,480
Hobart Town	359,250	324,895
Totals at each port	£908,265	£762,375

EXPORTS.

Port.	1864.	1865.
Launceston	£506,891	£462,965
Hobart Town	468,839	418,000
Totals at each port	£975,730	£880,965

Those who wish to see them more in detail may do so by consulting the following table, which shows the countries with which we have been

trading, and the amount of our trade with each, during the two years :—

IMPORTS.

Countries.	1864.	1865.
United Kingdom	£252,590	£187,820
New South Wales	37,000	34,685
Victoria	224,005	160,925
South Australia	1,690	10,515
New Zealand	10,215	585
Mauritius	17,130	27,960
Valparaiso	—	4,380
Southern Whale Fisheries	6,385	10,610
Total Hobart Town	£549,015	£437,480
Total Launceston	359,250	324,895
Total both ports	£908,265	£762,375

EXPORTS.

Countries.	1864.	1865.
United Kingdom	£251,285	£238,360
New South Wales	36,355	50,450
Victoria	104,480	116,575
South Australia	6,295	9,545
Queensland	5,060	6,895
New Zealand	103,076	39,670
Mauritius	340	765
Guam	—	615
Total Hobart Town	£506,891	£462,965
Total Launceston	468,839	418,000
Total both ports	£975,730	£880,965

These tables exhibit a falling off, instead of an increase, on the two years, and so do the shipping returns, which were as follows :—

VESSELS INWARDS FOR 1864 AND 1865.

Port.	Tons, 1864.	Tons, 1865.
Hobart Town	72,654	56,113
Launceston	52,005	44,163

VESSELS OUTWARDS FOR 1864 AND 1865.

Port.	Tons, 1864.	Tons, 1865.
Hobart Town	74,864	58,438
Launceston	48,927	43,750

This decrease is to be attributed to our having lost much of the New Zealand trade, and to the decline on our export of timber, at one time a source of considerable revenue. In 1853, when there was so great a rush to the goldfields of Victoria, we exported timber to the value of £443,161. Last year it did not amount to more than £56,698. It is less in demand, and the timber of other colonies has been brought more into competition with it. But our timber trade is deserving of a notice by itself.

TIMBER TRADE.

There are no records of any export of timber from this colony further back than 1838. At that time its declared value was £11,563, and for the next ten years it fluctuated between that and £20,464. The shipments for those years were to South Australia and Victoria, probably in about equal quantities, and the kind of timber sent was chiefly used for the construction of out-buildings and roofing purposes. But within

the next five years we find our export gradually creeping up from £20,464 to £89,507, the last of these years being nearly three times the amount of the preceding one. That was chiefly owing to the discovery of the Victorian goldfields, and to the demand for temporary erections to provide for the vast population that was then pouring in on those shores, which made the trade a highly remunerative one. In 1853, our export of timber of all descriptions amounted to £443,161, but it would have been in vain to expect it to continue at that rate, and we therefore begin to trace its decline. These are the returns for that period to the date of the latest official returns, namely, 1865:—

TIMBER EXPORTED FROM 1854 TO 1865.

1853	... Timber exported	...	£443,161	1860	... Timber exported	...	£73,726
1854	... " "	...	306,857	1861	... " "	...	55,850
1855	... " "	...	98,546	1862	... " "	...	62,231
1856	... " "	...	112,753	1863	... " "	...	69,881
1857	... " "	...	133,473	1864	... " "	...	81,265
1858	... " "	...	110,101	1865	... " "	...	56,698
1859	... " "	...	82,122				

We have thus got down to the standard at which we were exporting before the Victorian goldfields were discovered, and should probably have attained that earlier but for the trade that sprung up in the interim with New Zealand, consequent upon the discovery of goldfields in the Middle Island, and the breaking out of the war in the Northern Island. Something must also be placed to the account of the reduction in the price of timber during the interval, which has made it less valuable as an article of export. And it points, moreover, to a state of things upon which the public mind in Tasmania is becoming more fixed. If the export of timber does not pay as it once did, we must seek for some more valuable export. And where is it to be sought but in the tillage of our fields? We have spoken of gold, of iron and iron ores, and of other metallic mineral and earthy deposits, but agriculture is our mainstay, and to that we must look more than ever. On that, there is a great awakening in the public mind in Tasmania, and we look to it in time for the best results. Our forests of timber are exhaustless, but it would be useless to work them if they do not pay, or, if there be not a sufficient demand for the stuff. For cereal produce there is always a demand in these colonies, and, taking one year with another, at remunerative prices.

GENERAL STATISTICS.

POPULATION.

Our earliest population returns date back to 1816, and it may be interesting to some to look at them at the different stages of their increase. Let us start with them then at 1825, and take the successive decennial periods. They were as follows:—

1825	Population of the colony	14,192
1835	ditto	40,172
1845	ditto	No return.
1855	ditto	69,962
1865	ditto	95,201

But the returns for the last-named of these periods must be set out a

little more at length. As compared with the previous year, the population of the colony was as follows:—

POPULATION OF THE COLONY.

Year 1864	Population	93,307
Year 1865	ditto	95,201
Increase during 1865		1,894

The way in which that increase arose is exhibited in the following tabular statement, which shows the increases by arrivals and births, the decreases by departures and deaths, and the preponderance of the numerical increases over the numerical decreases:—

POPULATION FOR 1865.

Estimated population, December 31st, 1864		93,307
Increase by arrivals	3597	
Ditto by births	3069	
Total	6666	
Decrease by departures	3509	
Ditto by deaths	1263	
Total	4772	
Deduct decrease from increase, and add increase		1,894
Total for 1865		95,201

The net increase for the year was, consequently, comparatively small, and so it must continue unless something is done for a revival of immigration. Of this, there has been much said of late, but no definite plan has yet been fixed upon for this purpose.

WASTE LANDS ALIENATED AND UNALIENATED.

The following is taken from a Parliamentary paper laid on the table of both Houses of Parliament during the present year. It brings down the Surveyor-General's returns to the close of 1864:—

RETURN SHOWING THE AREA OF TASMANIA AND ITS DEPENDENCIES,

Distinguishing alienated and unalienated lands, up to the 31st December, 1864:—

Area of Tasmania, exclusive of Islands and Lakes		15,571,500	acres
Islands in Bass's Straits.			
North-East Group	Flinders	513,000	,,
	Cape Barren	110,000	,,
	Clarke's	20,000	,,
	All others	27,000	,,
North-West Group	King's	272,000	,,
	Robin's	24,500	,,
	Three Hummock	19,000	,,
	Barren	18,400	,,
	Walker	1,700	,,
	All others	1,900	,,
	Schouten Island	7,000	,,
	Maria Island	24,000	,,
	Bruni Islands, North and South	90,000	,,
	All other Islands, say	2,500	,,
Lakes.			
Discharging southerly		65,500	,,
Ditto northerly		10,000	,,
Total area of Tasmania		16,778,000	acres
Area of alienated land		3,403,010	,,
Ditto unalienated, including Lakes		13,374,990	acres

Taking the population of the colony at 95,000 souls, this gives rather more than 35,000 acres of alienated land for every man, woman, and child in the colony. But the unalienated lands of the colony are the most remarkable feature in this return. After making the largest conceivable deduction for comparatively worthless land, and for lakes, there is still room for four times the present amount of population with a similar liberal apportionment to that given above—namely, 35,000 acres to every man, woman, and child.

A very large proportion of the land alienated in this colony has been by grant from the Crown, and only a small proportion by sale. Of the town land alienated by grant, there are no reliable records, but the following is a return of the country land granted and sold, showing the relative proportions of each :—

COUNTRY LANDS GRANTED AND SOLD SINCE 1804 TO DECEMBER 31ST, 1864.

Acres of land granted	2,098,763
Number of grants	3,568
Acres of land sold	1,278,746
Number of lots	4,730
Amount sold for	£970,596
Total acres of country land disposed of	3,377,509

The system of selling land on credit has answered very well in Tasmania, but there are, of course, arrears to a considerable amount due. This was the state of the case at the close of 1864 :—

TOTAL AMOUNT OF DEBT DUE ON LAND TO 31ST DECEMBER, 1864.

Description of Land.	Amount due.		
Town lands	£6,761	8	0
Agricultural lands	98,589	0	5½
Pastoral lands	95,527	2	5
Pre-emptive rights, and 74th sec.	57,874	3	9
Total	£258,751	14	7½

To these we may add one more tabulated statement, with regard to that portion of the public debt secured on the land fund. It is as follows :—

DEBT OF THE COLONY SECURED ON THE LAND FUND ON THE 31ST DECEMBER, 1864.

Total amount of debentures outstanding and chargeable on the Land Fund, as furnished by the Colonial Treasurer	£314,780	0	0
Debts due on account of land sales	258,751	14	7½
Difference	£56,028	5	4½

It would, however, be a most mistaken notion to suppose that this is all the security the debenture-holders have for their advances. Their security is on the whole of the public lands of the colony, and not on that portion of them only that has been sold on credit.

WHALING STATISTICS.

This branch of industry has been always popular in Tasmania. Whaling was commenced in our waters by ships from England and Sydney more than fifty years ago. The first vessels fitted out as whalers from Hobart Town were two brigs, owned respectively by Captain Fane and an American negro named Hazard. The cruising ground was Frederick Henry Bay, a few miles from Hobart Town. Bay whaling, prosecuted by shore parties, was established about forty-seven years ago, and was carried on for many

years with great success. Drouthy Point was the first station, but shore parties were soon established at Tinder Box Bay; Bull, Trumpeter, and Adventure Bays on the eastern shore of Bruni Island; and at South Port and Recherche Bay at the sea mouth of D'Entrecasteaux Channel. Whales being exceedingly plentiful, many of the old residents were induced to risk their capital in the prosecution of this exciting business. Whale fisheries were established on the East Coast at Lagoon, Blackman's, Oyster and Spring Bays, at Maria and Schouten Islands, and as far north as Eddystone Point, and south of Recherche Bay, in the neighbourhood of the Witches. The whaling business was a very popular one with our Tasmanian youth, it being full of exciting and perilous adventure. One of the earliest, if not the very earliest, Tasmanian headsman was Mr. James Foley, who was killed off Brown's River, after the regular season was over, by a chance whale, which he attempted to capture, his wife standing on the cliff and witnessing his death. Captains J. Kelly, Fane, J. Sherbett, W. Young, and many others, were amongst our earliest headsmen, and were celebrated as daring and most successful whalers. The competition was of the most exciting kind. Twenty-one boats have started in chase at one time from the look-out at Recherche Bay, and twenty-four whales were secured by one boat in one winter. For each whale captured a notch was cut in the logger-head, and a headsman was as proud of his notches as an Indian warrior of his scalps. Messrs. M'Lachlan and Young in one season secured 800 tuns of oil, and a proportionate quantity of bone. Four whales have been secured by one boat in one day. Bay whaling being so remunerative, sperm whaling was almost neglected. The constant harassing and destruction of the whales, and the killing of the calves, had the effect of either exterminating them, or of causing them to leave our shores. In 1843 their numbers had declined, and in 1847 bay whaling may be said to have died out. Mr. G. Watson was, we believe, the last who fitted out a shore party. Messrs. M'Lachlan and Young, Captain Kelly, Kerr, Alexander and Co., Petchy, Dr. Imlay, Johnston and Gardiner, and George Watson were the most prominent of the bay whaling owners. This important business employed for six months of the year a great number of men, who, in the summer, engaged themselves in agricultural and other pursuits.

On the decline of bay whaling, ships were fitted out to prosecute sperm whaling. Our whaling fleet, just before the discovery of gold, numbered 40 sail of ships, carrying 200 boats, 2000 tuns of casks, and crews numbering in the aggregate 1000 men. Great success attended the whale ships, and many splendid voyages were made. The largest take in the shortest time that we remember was that of the Grecian, when commanded by one of our most noted whalers, Captain John Wason, who secured in three days whales which, when tried out, yielded 39 tuns of oil, 10 tuns being sperm. The discovery of gold in 1851 dispersed our noble fleet of whalers, but in 1862 it again numbered 25 ships. The low price of oil and bad voyages caused the failure of one of the largest owners, and the withdrawal of several ships by another owner, who employed them in the guano trade, reduced the number engaged in whaling to five. Sperm oil having of late ruled at very high rates, ships have recently been fitted out, and the number at present engaged in this important trade is eight. For the whole of the foregoing we are indebted to Mr. Macmillan, an old colonist, who has long taken a deep interest in this subject.

The total tonnage of the sailing vessels and steamers belonging to Hobart Town is 11,491 tons.

The total tonnage of sailing vessels, steamers, and river craft for Launceston is 3596 tons.

The total tonnage of river craft registered at Hobart Town is 1545 tons.

THE SALMON EXPERIMENT.

We had devoted a chapter of some length to this, but must dismiss it with little more than names and dates. It is now ten years since a committee of the House of Assembly was appointed to consider and report on the introduction of live salmon into Tasmania. That was in 1856. Mr. Innes was chairman, and the committee suggested the opening up of a correspondence with Messrs. Ducroz, Dunn, and Youl, then in London, and the offer of a reward of £500 to the first person who should successfully do this. Mr. Alexander Black reported generally on the subject in 1860, and his report was referred to a committee of the House of Assembly, of which Mr. William Archer was chairman. The committee highly approved of Mr. Black's report, and recommended immediate action. Mr. Youl took up the matter with much disinterested zeal in London, and was associated with Mr. Edward Wilson, of Melbourne, then in London, in this. The result was the despatching of salmon ova by two vessels, the S. Curling in 1860, and the Beautiful Star in 1862, but both these attempts were failures. It then occurred to Mr. Youl that salmon ova might be brought out in a state of perfect preservation, if packed in ice and moss, and he made some experiments on this at the Wenham Lake Ice Company's works, which perfectly satisfied him on the subject. Salmon ova so packed was found to be in a perfect state of preservation at the end of ninety days, and afterwards for a longer period. Mr. Youl now set himself to work zealously with Mr. William Ramsbottom and others in London to gather salmon ova for despatch to Hobart Town packed in ice and moss, but there was a difficulty about getting it out direct, owing to the dread of any ordinary trading vessel being too long on the voyage. This was obviated by Messrs. Money Wigram and Sons offering to bring it out in one of their clipper ships to Melbourne, and this was done in 1864, and proved a complete success. Salmon ponds had long before been prepared at the Plenty, and the ova on its arrival from Melbourne was placed there, and successfully hatched under the superintendence of Mr. W. Ramsbottom, jun. The fish hatched that year are now out at sea, and are expected back some time in January or February next. Brown trout ova was brought out and hatched at the same time, and the fish from it have since spawned, and their ova has been sent to different places, to Melbourne among the rest. This year, we have had a second batch of ova out from England, packed in the same way, and that has been hatched by Mr. Ramsbottom with the like success. The history of this experiment is full of interest, but this is nothing more than an outline of it. We have now all that we could desire in this way, and shall have salmon and trout in a few years enough to stock the whole of this hemisphere.

INTERCOLONIAL EXHIBITION, 1866-67.

OBSERVATIONS

ON THE

RESOURCES AND CLIMATE OF NEW ZEALAND.

[EXTRACTED FROM "STEVENS AND BARTHOLOMEW'S DIRECTORY FOR 1866-67."]

THE RESOURCES OF TARANAKI,

BY THOMAS KELLY, ESQ.

DESCRIPTIVE PARTICULARS OF THE PROVINCE OF SOUTHLAND,

BY J. H. BAKER, ESQ.

REPRESENTATIVE COMMISSIONER AT MELBOURNE:

HON. J. G. FRANCIS.

OBSERVATIONS

ON THE

RESOURCES AND CLIMATE OF NEW ZEALAND.

New Zealand consists of three islands—the North, the Middle, and Stewart—extending north and south 1100 miles, and bearing from Australia south-east about the same distance. Surrounded as they are by the vast South Pacific Ocean, the climate is acknowledged to be the most salubrious, agreeable, and healthy among all the British colonies.

The North Island is about 500 miles long, and contains about 29,688,000 acres; the Middle Island, 550 miles long, about 28,422,000 acres; and Stewart Island, 30 miles long, about 1,000,000; thus giving a total of 58,101,000 acres—while Scotland, 270 miles long, contains about 17,000,000 acres; England, 345 miles long, containing 32,000,000 acres; Wales, 120 miles long, contains nearly 5,000,000 acres; and Ireland, 280 miles long, contains 19,000,000 acres; thus giving to New Zealand but one-third less area than Great Britain and Ireland. It is divided into nine provinces, as under:—

Wellington	Otago
Auckland	Canterbury
Hawke's Bay	Marlborough, and
Taranaki	Southland,
Nelson	

Regarding all of which (in order) will be found a short descriptive account. We may add the only notice appearing regarding the Southern, or Stewart Island, in which there are only a few sawyers, together with about 100 Maories, the former of whom are engaged in preparing the timber (which here grows in great luxuriance) for building purposes, &c.; the latter in fishing. This island is mountainous, but indented with fine harbours. Spring begins in August, summer in November, autumn in April, winter in June. The days of summer are two hours shorter, and of winter two hours longer than in England. The nights are twelve degrees colder than the days. The North Island is seven degrees, and the Middle Island two degrees warmer than London. January and February are the warmest months, June and July the coldest. Strawberries are ripe in November, December, and January; cherries and gooseberries, in January; apples, pears, plums, and peaches, in February; and melons, figs, and grapes, in March and April. The North Island of New Zealand comprises 29,688,480 acres, as follows:—Area of province of—

Auckland	17,000,000 acres
Hawke's Bay...	2,816,000 ,,
Taranaki	2,399,360 ,,
Wellington	7,473,120 ,,
Total	29,688,480 acres

THE HARBOURS OF NEW ZEALAND.

The harbours of this colony are one of its most remarkable features. It possesses a great number, many of first-rate excellence. But one inconvenience attends most of them—viz., they are not generally in connection with any considerable quantity of level land, *vide* Akaroa, &c., while even Port Lyttelton and Port Chalmers are separated from the open country by heavy ridges of hills.

VEGETATION.

The natural vegetation of the soil is of three sorts—forest, fern, and grass. The former is interspersed in all the hilly country (comparatively) in the Northern Island. The whole of the eastern portion of the Middle Island, and some extensive plains on the northern side of Cook's Strait, extending as far as Wanganui and Hawke's Bay, are clothed with most excellent natural pasture.

GRAZING CAPABILITIES.

It is difficult to form any estimate of the quantity of stock which the grazing districts of New Zealand will carry. All that can be said with certainty is, that the natural pastures are as good as any in the world, and that there are millions of acres of it equally fitted for cattle and sheep—the climate in the Middle Island being peculiarly well adapted for sheep. The average annual increase on a breeding flock is not less than ninety per cent.

CENSUS OF NEW ZEALAND, 1864.

POPULATION.

Provinces.	Males.	Females.	Total.
Auckland	25,686	16,446	42,132
Taranaki	2,872	1,502	4,374
Wellington	8,342	6,645	14,987
Hawke's Bay	2,456	1,313	3,770
Nelson	6,706	5,204	11,910
Marlborough	4,032	1,487	5,515
Canterbury	18,931	13,345	32,276
Otago	32,692	16,327	49,012
Southland	4,806	3,279	8,085
Chatham Islands	56	30	86
General totals (exclusive of military and their families)	106,580	65,578	172,158

The numbers of Military Settlers and the Colonial Defence Force, included in the above table, were 5139 Males and 1243 Females; total, 6382.

Their distribution on the census night was as follows:—Auckland: Males, 4035; Females, 1089. Taranaki: Males, 969; Females, 118. Wellington: Males, 35; Females, 14. Hawke's Bay: Males, 100; Females, 22.

The result of the census taken in December, 1864, shows a steady increase in our general prosperity. At that period the European popula-

tion, exclusive of the military and their families, amounted to 172,158 souls, being an increase of 73·71 per cent. on the population of 1861, which was an increase on that shown by the census of 1858 of 66·82 per cent., which was an increase as shown by the census of 1851 of 121·86 per cent., the population then being only 26,807.

The last census shows the population of the Middle Island 106,668, and of the North Island 65,263.

The military 9136, with their families 2837, makes a total of 11,973, and these added to the European population amount to 184,181.

The increase for half-year ending 30th June, 1865, by immigration (over seas), males, 5640; females, 3865; total, 9505; and by births (males, 1697; females, 1633; total, 3330), giving the total given increase (males, 7337; females, 5498) of 12,835. After deducting the decrease in immigration (over seas) and deaths, the given increase is 7789; so that, on the 1st January, 1866, we may assume the European population of New Zealand to have been 199,482.

The several Provinces, for the half-year ending 30th June, 1865, show an increase to the population of Auckland nearly three times that of all the other provinces together, thus:—

Auckland, increase, males 2884, females 2661—total, 5545. Taranaki, decrease, males 14; increase females 15—total increase 1. Wellington (including Lowry Bay and the General Government Pilgrims), increase, males 223; females 127—total 350. Hawke's Bay, increase, males 24; females 32—total 56. Nelson, increase, males 349; females 109—total 458. Marlborough, increase, males 30; females 20—total 50. Canterbury, increase, males 759; females 666—total 1425. Otago, decrease, males 464; increase, females 407—total decrease 57. Southland, decrease, males 83; increase, females 43—total decrease 40.

The Total Number of Acres in the Possession of Europeans under Crop in the several Electoral Districts in December, 1864.

Town of Wellington, 908; Mangonui, 984; Bay of Islands, 6430; Marsden, 8295; Northern Division, 14,229; City of Auckland East, 120; City of Auckland West, 310; Parnell, 657; Newton, 646; Pensioner Settlements, 2758; Town of Onehunga, 1047; Franklyn, 23,786; Raglan, 27,885; Grey and Bell, 6833; Town of New Plymouth, 273; Omata, 2611; Wanganui, 36,785; Rangitikei, 18,926; Porirua, 16,113; Hutt, 10,498; Wairarapa, 12,185; Town of Napier, 5712; Clive, 16,168; Collingwood, 1505; Motueka, 9043; Town of Nelson, 1444; Suburbs of Nelson, 3974; Waimea, 15,322; Town of Picton, 1978; Wairau, 5846; Cheviot, 15,349; Kaipoi, 12,561; Avon, 16,100; Heathcote, 15,709; Ellesmere, 1867; Town of Christchurch, 1290; Town of Lyttelton, 100; Akaroa, 3293; Timaru, 3591; Hampden, 8503; Bruce, 31,914; Dunedin and Suburbs, North, 2060; Dunedin and Suburbs, South, 5524; Wallace, 9931.

The Number of Acres in the Possession of Europeans under Crop in the several Provinces in December, 1864.

Wellington, 95,416; Auckland, 87,556; Canterbury, 68,727; Otago, 48,373; Nelson, 32,068; Hawke's Bay, 21,880; Taranaki, 9769; Southland, 9549; Marlborough, 8189.

LIVE STOCK IN THE POSSESSION OF EUROPEANS IN THE SEVERAL PROVINCES IN DECEMBER, 1864.

	Horses.	Asses.	Horned Cattle.	Sheep.	Goats.	Pigs.	Poultry.
Auckland	7,482	113	42,294	73,151	3,264	13,072	105,404
Taranaki	737	—	4,229	12,350	27	368	4,570
Wellington	7,356	90	49,200	411,502	1,016	13,073	42,064
Hawke's Bay	2,780	9	14,552	537,094	1,501	2,176	11,682
Nelson	3,597	16	15,825	341,281	522	4,033	25,579
Marlborough	2,735	16	7,483	456,374	3,930	2,708	9,516
Canterbury	10,868	62	45,263	1,567,320	769	18,028	73,745
Otago	11,267	30	56,945	1,311,345	750	6,368	85,490
Southland	2,579	3	13,230	235,056	234	1,072	18,649
Totals	49,401	339	249,021	4,945,473	12,013	60,898	376,699

REVENUE OF THE PROVINCES FOR QUARTER ENDING 30TH JUNE, 1865.

Auckland, £57,913; Taranaki, £5386; Wellington, £22,798; Hawke's Bay, £6230; Nelson, £11,250; Marlborough, £2557; Canterbury, £31,483; Otago, £64,131; Southland, £7315—total, £229,445.

EXPENDITURE OF THE PROVINCES FOR QUARTER ENDING 30TH JUNE, 1865.

Auckland, £35,324; Taranaki, £3766; Wellington, £15,290; Hawke's Bay, £3086; Nelson, £8046; Marlborough, £2480; Canterbury, £31,802; Otago, £50,914; Southland, £6302—total, £299,817.

The general revenue, £20,382, and expenditure, £142,807, included in above.

CUSTOMS REVENUE AT THE SEVERAL PORTS, FOR QUARTER ENDING 30TH JUNE, 1865.

Auckland, £49,938; Russell, £608; Mangonui, £470; Hokianga, £11; New Plymouth, £4512; Wanganui, £5492; Wellington, £14,694; Napier, £5359; Collingwood, £85; Nelson, £9241; Picton, £562; Havelock, £518; Wairoa, £668; Lyttelton, £20,195; Akaroa, £381; Timaru, £1889; Hokitika, £3162; Dunedin, £54,909; Molyneaux, £21; Oamaru, £705; Invercargill, £5050; Bluff, £157; Riverton, £425—total, £179,052.

VALUE OF EXPORTS AT THE SEVERAL PORTS DURING THE QUARTER ENDING 30TH JUNE, 1865.

Auckland, £20,025; Mangonui, £177; Hokianga, £936; Wellington, £6428; Wanganui, £22; Napier, £14,305; Nelson, £29,533; Havelock, £701; Picton, £5355; Wairau, £21,174; Lyttelton, 86,761; Hokitika, £112,148; Dunedin, £287,869; Invercargill, £14,184—total, £529,620.

VALUE OF IMPORTS AT THE SEVERAL PORTS FOR THE QUARTER ENDING 30TH JUNE, 1865.

Auckland, £537,927; Russell, £603; Hokianga, £377; New Plymouth, £25,988; Wanganui, £17,963; Wellington, £154,763; Napier, £17,584; Nelson, £105,493; Collingwood, £150; Picton, £2423; Wairau, £1827; Lyttelton, £127,707; Hokitika, £8230; Akaroa, £790; Timaru, £5682; Oamaru, £507; Dunedin, £433,478; Invercargill, £18,775; Bluff, £1283; Riverton, £1398—total, £1,462,948.

Value of Exports for the several Provinces during the Quarter ending 30th June, 1865.

Auckland, £21,140; Taranaki, nil; Wellington, £6450; Hawke's Bay, £14,305; Nelson, £29,533; Marlborough, £27,230; Canterbury, £198,909; Otago, £287,869; Southland, £14,184.

Number and Tonnage of Vessels Cleared Outwards at the several Ports during the Quarter ending 30th June, 1865.

Auckland, 69 vessels, 25,887 tons; Russell, 3 vessels, 952 tons; Mangonui, 1 vessel, 400 tons; Hokianga, 1 vessel, 163 tons; Waikato, 3 vessels, 644 tons; New Plymouth, 5 vessels, 1294 tons; Wanganui, 12 vessels, 2141 tons; Wellington, 15 vessels, 5578 tons; Napier, 3 vessel, 840 tons; Nelson, 17 vessels, 5429 tons; Lyttelton, 9 vessels, 4156 tons; Hokitika, 7 vessels, 752 tons; Dunedin, 37 vessels, 17,818 tons; Invercargill, 5 vessels, 709 tons. Total, 187 vessels, 66,763 tons.

It will be seen from the above which is the principal shipping port of New Zealand.

Quantity and Value of Gold Exported from 1st April, 1857, to 31st March, 1865.

Auckland, 10,816 ozs., £33,745; Nelson, 91,284 ozs., £353,706; Marlborough, 27,075 ozs., £103,911; Canterbury, 23 ozs., £91; Otago, 1,724,436 ozs., £6,682,188. Total, £7,173,641.

IMPORTS AND EXPORTS.

By *Gazette* we have the returns of imports and exports for the quarter ending 31st December, 1865. We review the revenue returns, pointing out in how far, in our opinion, these ought to be taken as evidence of the prosperity of the colony. Referring to the returns before us, we find the following results :—

Imports, December quarter, 1864, £1,460,732; 1865, £1,299,771; decrease on quarter, £160,961. Exports, December quarter, 1865, £1,140,540; 1864, £668,569; increase on quarter, £471,971. Imports for 1864, £6,997,357; 1865, £5,587,683; decrease on the year, £1,409,674. Exports for 1865, £3,724,691; 1864, £3,407,909; increase on the year, £316,782.

It is thus seen that whereas there has been a falling off in the estimated value of imports both on the quarter and on the year, as compared with the previous year, there has been an increase in the value of exports in the two periods to a considerable extent. The item of £1,409,674, on the year's trading of 1865, shows a very considerable fluctuation of trade; and this great reduction is but poorly compensated for by the increase in exports, seeing that this is entirely made up of gold. The total value of gold exports on the December quarter was worth £993,444, as against £361,977 in the same period of 1864. These figures are sufficient to account for the increase in question. So that it would appear, with a much larger production of gold, there has been no stimulus given to business. On the contrary, business transactions, measured by imports, were greatly curtailed. We do not think that this is any proof of back-going, however. It is a well-known fact that there was a great deal of over-trading and

undue speculation in 1863-64, and stocks were wisely reduced in the past year. On the whole, therefore, these returns may be said to be satisfactory.

Referring to Auckland, we find that in imports and exports there has been a decided falling off on the quarter. The value of imports at this port in the December quarter of 1865 was £256,662, as against £433,049 in the corresponding period of 1864. Of exports, the last December period showed a total of £125,991, contrasted with £175,444 in 1864. There has also been a falling off at all the sub-ports of this province. The imports for the year 1865 at Auckland were valued at £1,842,416; compared with £2,218,287 in 1864. The exports last year were worth £292,802; for 1864, £329,243.

GENERAL RESOURCES.

MINERALS.

New Zealand generally is very rich in mineral resources. First in importance among the list it behoves us to notice "gold," which was discovered in the Province of Otago in 1861, and at Hokitika about January, 1865, and is now being found in large quantities along the West Coast—extending from sixty miles south of Hokitika—viz. (the South Beach, five miles south of Okarita), to the Buller, eighty miles from Nelson, a distance of nearly 140 miles, and back as far as the dividing range, which, in some instances, is from sixty to eighty miles from the coast. Along the coast, on the sea beach, the richest deposits have been found by just digging down in the sand (in many instances only a few inches) till you come on a layer of *black sand*, in all of which will be found a greater or less quantity of the precious metal; which, here, is generally as fine as flour, and requires careful manipulation and the use of baize on the cradle to save it. Within seven miles of Hokitika, up the river, is a diggings called the "Kaneiri," where the ground is very wet and the sinking deep, and to work which necessitates the use of an engine for pumping. On this, at present, there are twelve engines at work, and the claims in some instances are turning out very rich, and the people are generally of opinion that this will prove a good, rich, and lasting diggings.

Up the Grey River there are many rich claims, also daily reports of very heavy finds, and many of the miners do extremely well. The weather, also, during the last season has been unusually dry, so that the miners have not lost many days—a great consideration in this country. With regard to the prospects of the yield of gold continuing, the general impression (which is being justified by the result—viz., the increase of gold shipped) is that the yield will continue to increase for some years yet; the country being undoubtedly very rich in this valuable metal, and only requiring to be thoroughly prospected to have it brought to light.

In Otago Province, besides the alluvial diggings, which are being worked on a systematic and extensive scale by ground-sluicing generally, and which are paying well, a number of comparatively rich and easily-worked quartz reefs have been discovered; and owing to the large water supply, it being quite practicable in most instances to bring a *race* at a

sufficient height to give power to work the crushing machinery on the turbine principle, they can be worked cheaply, and are attracting the attention of capitalists, as they promise well.

At Coromandel, forty miles from Auckland, on the Thames estuary, are numerous quartz reefs, some of which are paying handsome returns—the yield per ton in this locality generally not being very great yet, but the body of reef very large; consequently, a large quantity of stone can be crushed.

At Patea, near Wanganui, several fine specimens impregnated with quartz were picked up by the officers during General Cameron's short campaign there in 1865, and from the appearance of the country it is confidently expected that payable gold will be found there.

All over the Waikato, also, the *colour* can be got; and the quartz, which is very abundant in the district, is a very good indication of the presence of the precious metal.

At Riverton, in Southland Province, there is also a beach diggings, where a few of the claims are rich.

Also, at Moeracki Beach, eighty miles north of Dunedin, gold has been found on the beach; so that reasonable probability exists of good diggings being discovered all round the coast of the Middle Island. The proprietors of this work are also enabled to state that several parties are now prospecting the beaches all along Southland and Otago Province coasts, and that they have in several instances found gold.

COPPER, LEAD, CHROME, ETC.

With regard to the first—viz., copper—it has been worked to a limited extent at the Dun Mountains, about seventeen miles inland from Nelson, for which a line of rail has been laid, at great expense, to transport the ore to Nelson wharf for shipment; but, unfortunately, the ore has not, we believe, continued rich enough to pay for the development of this mine. This ore is also being worked on a large scale at the Great Barrier Island, near Auckland, and is promising very good returns, we believe. Lead (in which there is a proportion of silver) is said (and we believe the assertion) to have also been found, and, from the appearance and geological formation, the presence of such might be reasonably expected to be found in Nelson Province. With regard to chrome, we regret having been given to understand that the mines are stopped, owing to the great expense now necessary in its procural, and its scarcity. Iron, tin, plumbago, &c., have also been found. Under heading of "Descriptive—Nelson, Provincial"—will be found Dr. Hochstetter's report on the geology of Nelson Province, where the copper, chrome, &c., have been found.

THE IRON-SAND OF NEW ZEALAND.

The titaniferous iron-sand found in such large quantities and so widely spread on the sea-coast of New Zealand is capable of yielding iron of the highest quality, as has already been thoroughly demonstrated; and the metals manufactured according to the economic and efficient process invented by Mr. Charles Martin, C.E., having proved in the comparative tests to which they have been submitted fully equal in tensile strength and general character to the most celebrated English irons produced upon the usual costly principles. The applicability of titaniferous iron to the im-

provement of lower-class manufactures, as well as its great value as a distinct article in the trade, is generally acknowledged; and the interest attached to the proposition to utilise the titaniferous ores upon a practical scale has been evidenced by the interesting communications referring to it, which have recently been published in the *Mining Journal*, from Dr. Gurlt, Mr. Lundt, and others equally well acquainted with their properties. Indeed, the peculiarities of the iron itself are alone sufficient to attract attention to it: but very little fuel is required to manufacture it into pig, and from pig it can be turned into puddled iron in just half the time usually allowed for puddling other iron; it resists the action of hydrochloric acid, and would thus be available for many purposes for which common iron is inadmissible; whilst the loss in puddling is only one-fourth of that usually sustained with other iron. According to the working of the iron in the puddling furnace, it can be given the hardness and much of the general character of steel, or the utmost softness of fencing-iron—a Staffordshire knot from the latter quality being closer than can be made from almost any other metal.

From tests made at the works of Messrs. Parkes, of Tipton, South Staffordshire, it has been proved that with iron from the New Zealand sand, 1¼ inch rounds, made into links for cables, were capable of bearing a tensile strain of fifty-two tons before breaking. And it is proposed by a company which has been formed to develop Mr. Martin's invention—viz., the New Zealand Iron and Steel Company—to bring the New Zealand titaniferous iron and steel regularly into the market, and for this purpose the inventor will speedily proceed to the colony with the requisite machinery, &c., and commence the manufacture, no doubt whatever being entertained that the result will be highly remunerative to all concerned. The quality of the steel produced from the sand was alluded to at the time when Messrs. Mosely produced the beautiful specimens of surgical instruments from it, and if, as it is now likely to be, it comes into the market as an ordinary article of commerce, its application cannot fail to be very extensive.

The New Zealand Iron and Steel Company, with a capital of £100,000, in shares of £10 each, has issued the following prospectus, the object of the undertaking being to develop an intention for the smelting of the titaniferous iron-sand of New Zealand:—

"This company is formed to work an invention for smelting the titaniferous iron-sand of New Zealand, and for such other purposes in connection therewith as may hereafter seem desirable.

"It is proposed to commence with the erection of works at the port of New Plymouth, in the province of Taranaki, in the north island of the colony, where the iron-sand exists in almost inexhaustible quantity.

"For many years endeavours to smelt this iron-sand have been made by the colonists, as well as by the metallurgists and iron-masters of England, but their numerous and careful experiments have not produced satisfactory results.

"In view of the great commercial advantages which must necessarily follow upon the successful working of the iron-sand, and with the knowledge that it is the desire of the New Zealand Government to assist and encourage so important an element of colonial prosperity, several gentlemen, having their attention called to the process of smelting the iron-sand, for which Mr. Charles Martin, C.E., has obtained from the Governor of New Zealand an exclusive right, by royal letters patent, decided a few

months since to co-operate with him in making experiments on a considerable scale.

"On analysis, this iron-sand is found to consist in every hundred parts of—

Per-oxide of iron	•88·45
Oxide of titanium with silica	11·43
Loss	12 = 100"

COAL.

Ranking first in importance is the coal mine at the Grey River, on the Nelson side, about two and a half miles above the Cobden township, the seam at which is about six feet thick, and is being largely developed, and supplies nearly all the steamers trading to the Greymouth township. The coal is of a very superior quality, nearly equal to Newcastle. Next, though we believe not less valuable, is the Kawa Kawa coal mine, Bay of Islands, six miles from the water up Kiri Kiri River, which is navigable for vessels of sixty tons. The emigrants located here have been engaged in making roads to this coalfield, which are now nearly completed. The coal is of a superior quality, and equal to New South Wales for steaming purposes (*vide* report of Commodore Wiseman), also equally well adapted for the generation of gas. The thickness of the seams vary from six to sixteen feet, and they crop out on the sidings in various places. This immense mine of mineral wealth is at present unworked, but the Government have it in view either to lease the right of working such, or to do so themselves.

Church of England settlement there—reports from Rev. Mr. Hall state the general satisfaction of the settlers with their location, also the fertility of the land, &c., and prove them to be animated with a determination to make the place go a-head.

Wangarei coalfield, three miles from the water, owned by Henry Walton, Esq., who has completed a tramway to water's edge, and is now supplying coal to the inhabitants of Auckland at 25s. per ton. This coal is said to be equal in quality, and is thought to be a continuation of the same seam as in Bay of Islands.

PETROLEUM.

Owing to the bituminous indications about the Sugar Loaf Hill (extinct volcano), near Taranaki, a shaft was sunk by a few enterprising men, with a view of getting petroleum. After sinking the shaft some considerable depth, and having exhausted all their means, success crowned their efforts, oil oozing slowly through the bottom of their shaft, which, on analysis by a clever Melbourne chemist, was by him pronounced petroleum of good quality.

This caused a considerable commotion, and several companies have now been formed for the prosecution of the discovery, boring operations being rapidly proceeded with, and the shares of all the companies, by last account, at a considerable premium.

About fifty miles south of Napier, also, the discovery of a series of oil springs has been reported and noticed in the newspapers; however, we have no knowledge of this, but merely state what is current regarding such. Also on D'Urville Island, near Nelson, several springs are reported to have been found.

Seeing the profitable result that has attended the working and distillation of the bituminous shale found in New South Wales, at Hartley and Wollongong, and the immense amount of money America gets yearly for her petroleum, a reasonable expectation may be formed that this may prove a considerable source of wealth to the district in which it has been or may be found.

NATIVE FLAX (PHORMIUM TENAX).

This plant, which is indigenous to the soil (and the growth of which is so luxuriant and rank as sometimes to attain the length of nine feet), is found in large quantities all over New Zealand, more or less. About ten years ago a considerable trade was done in this fibre, which was prepared manually by the Maories by scraping with a shell—by which means they took off the green outside coating, separated the fibre, and expelled nearly all the gum, which rots the fibre, and has hitherto prevented its adoption for any manufacturing purposes. The use of the shell not enabling the Europeans to prepare sufficient quantities to pay for the labour entailed; and the Maories, even, now having nearly entirely given up preparing it so, has caused the trade in this article (the price got per ton for which was about £40) almost to disappear.

It is our pleasing duty, however, to state that a really practical solution of this difficulty has been achieved; and to Mr. Finlay M'Millan, of Tauranga, as the first to make such public, the inhabitants of New Zealand owe a deep debt of gratitude. His method, as detailed, is simple, expeditious, and efficacious; and we can assure the public that, having seen samples of fibre prepared (with no extra care) by his process, it has turned out a good serviceable article of commerce worth £27 per ton.

Mr. M'Millan's processes are:—1. Boiling in cow-dung for two or three hours, and then washing in cold water. 2. Boiling for an hour with a small proportion of common salt, and washing as before stated. 3. Boiling for an hour in salt (sea) water, and washing in cold water as in Nos. 1 and 2. By either plan an industrious person can earn fair wages, and add considerably to the prosperity of the country.

We may add, in conclusion, that the samples prepared by salt and sea water are purer coloured than flax prepared by cow-dung; and the fibre appears to be about equal. Possibly it would be an improvement were flax prepared in sea-water kept in steep in fresh water for twenty-four hours, and thoroughly dried before being put up in bundles or bales. But this is a matter of detail, which experience will soon determine.

We are also glad to notice that Mr. Finlay M'Millan has been making still further experiments in the preparation of flax, having been superintending the erection of a machine for dressing such by the process already made known. He has caused a quantity of green flax to be subjected to the action of steam at Messrs. Fraser and Tinne's, Auckland, for half-an-hour—the steam being at the pressure of 45 lbs. to the square inch. When the flax was taken from the boiler and passed through the rollers, it was found the gum was thoroughly released, and an admirable sample of flax produced.

We are much gratified by noticing by the latest news to hand from Auckland, that considerable quantities of this flax were being brought to market and sold at from £20 to £36 per ton, and that the people generally were daily becoming more prepossessed in its favour and profitableness as

an article of manufacture and export, which we firmly believe and cordially trust will be the case. Intending manufacturers of flax fibre would do well to visit Messrs. Fraser and Tinne's Phœnix Foundry, Auckland, where they will see, manufactured and in stock, the most improved, simple, efficacious, and comparatively inexpensive machinery suitable for the treatment of *large quantities* of this fibre, which reduce the proportion of labour, and so much enhance the profit of production.

TIMBER.

The forests in Auckland Province, the west coast of the Middle Island, and Stewart's or the Southern Island, are very valuable, and their timber, consisting of Kauri, red, and white pine, Rimu, Totara, birch, Rata, &c., &c., is the (at present) most valuable export from Auckland Province, and we may add the only (comparatively) export from Stewart's Island. In Auckland Province the "Kauri" grows so luxuriantly that trees of twenty feet in circumference at the base are numerous, and while we take into account its proverbial straight growth and freedom from the attacks of worms and insects, owing to the (to them) deadly bitter acid inherent in it, and its peculiar adaptability for spars, building purposes, &c., we can well believe that its qualities only require to be known to be appreciated.

KAURI GUM.

This is found in very considerable quantities in several districts contiguous to Auckland and in the province, and forms a valuable article of export, which formerly the Maories used to monopolise, but which now has attracted the attention of, and the procural of which is forming the occupation of, numerous Europeans; and the consequence of such proverbial steady application (viz., the Europeans, who work steadily and regularly in comparison with the Maories generally, coupled with the fact of more people following the occupation) is a large increase in the quantity got, which, however, finds a ready market in London. The method of searching for and procuring this gum is worthy of notice, and is as follows:—A party goes with a long spear, having an iron barb, and pushes it into the ground to a depth of about two feet in likely places. Likely places, and where the gum is most frequently found, is in *hillocky* marshy plains, where fires have ages ago most likely burned Kauri forests, and where the *débris* forms small hillocks. In some instances over a ton of gum has been got at one tree, but the quantity generally averages from a few pounds to five cwt., and then, it must be recollected, that where it is found is far from a market, where bad or no roads lead to, and consequently the price got per ton often does not pay; at other times, if you are fortunate to discover it in a place easy of transit, say, for instance, by sea, you may do well.

SYNOPSIS.

In fact, from present appearances and the great development of the extraordinary resources of the colony, we are led to the belief that it will become the foremost of the Australasias in the future. Long secluded, petty and almost unnoticed, the settlements in these islands have suddenly sprung into a prominence and importance which recall the rapid progress of Victoria in the first days of the gold discovery. Communications have been quickly built up in those regions which were a hemisphere of mystery

to the old world a few short years ago. The turn of New Zealand is fast coming; within five years or so she has nearly doubled her inhabitants; and her bound into great importance has been so sudden that those great islands have not been named yet—countries as large as England and Scotland are only distinguished as the North and Middle Islands, the native appellations (unlike native ones in general), being in this instance too clumsy and long-winded for every-day use; while as for the common term New Zealand, it cannot, of course, serve for the future, and, as inappropriate and absurd, its withdrawal was long since determined on. If their present extraordinary advance be sustained, those islands will be soon well on the path to that magnificent destiny which, from their geographical position and great natural opportunities, was predicted for them by the thoughtful in England long before the first of our settlements was formed on their shores.

Perhaps it is in climate that New Zealand has the most striking advantage over the Australian continent. Being very mountainous, surrounded by the ocean, and far from any other land, there are no desert winds, and the moisture is perennial, and at all seasons reliable. The country is about the size of Great Britain, but the shape being much more elongated, there are greater varieties of temperature, for while the sugar-cane would grow in the peninsula of the extreme north, antarctic breezes give to the south the winter of Britain. As a whole, however, the climate has been compared not unjustly to that of Britain, in its vicissitudes at all seasons, and its influence on the soil and the human constitution. There is no country therefore better adapted for the transplantation of the Anglo-Saxon and Celtic races, with a successful perpetuation of the original type. It is entirely because of the difference of climate between New Zealand and the archipelagos of the Pacific that the Maories are so much more energetic, industrious, and masculine than their soft kinsmen of the Sandwich and Society Islands. And the earth, like the air, seems fashioned for the development of a great nation. Noble harbours indent the coast; great and deep rivers, hundreds of miles long, traverse the plains; the mountains are as high as those of Switzerland, the forests as majestic as in the tropics. And over so many degrees of latitude almost all useful plants, except those exclusively of the torrid zone, can find congenial growth—all cereals, from the hardy oat and rye which need the cold, to rice and maize which love the sun—all fruits and vegetables and their products, except, perhaps, wine, for which the restlessness of the atmosphere may not be well suited—all minerals, from gold, the most artificially valuable, to iron and coal, the most useful, are found. Then the constant verdure affords unlimited scope for grazing, and the adjacent seas yield abundance of fish. Just now the South Island has the largest population, because of the goldfields, but in more permanent advantages the North is vastly superior. It has not its neighbour's severe winters, the mountain masses do not engross so much of its surface, the extent of fertile land is far greater, and the navigable rivers have longer courses. The North Island must be the principal seat of agriculture and of internal and external trade.

As for the grand old native war race, it is fast passing away without fulfilling the dream of Sydney Smith, of amalgamating with its supplanters. Diffenbach estimated the Maories at 115,000 in the beginning of the present century. In 1861 an estimate, based on a recent census, returned them as 55,336, while now, nobody believes that they exceed 40,000 souls.

REPORT

ON THE

SOIL, CLIMATE, & CAPABILITIES OF TARANAKI,

BY THOMAS KELLY.

THE following short description of the Province of Taranaki, and of those few natural products which could be forwarded to the Intercolonial Exhibition with the small means at disposal, is merely intended to show in a small way a few of the raw materials which in this province await the means and energy of the capitalist to turn to valuable account. Nature has done much for Taranaki. Man has done little to forward, but much to retard, the development of the resources of this fertile and beautiful country. It is to be hoped that the time has now arrived when the feeble barriers erected by a semi-savage people to stay the advance of Anglo-Saxon industry and enterprise have been broken down, never again to rise.

Of late years the Province of Taranaki has been chiefly known as the battle-ground on which the Maori has made the last ineffectual struggle against the irresistible advance of civilisation and the supremacy of British law; and the conflict on his part has been none the less fierce because of the high estimation in which he holds the soil of Taranaki. The Maoris have as keen an eye for a goodly location as was said to be possessed by the monks of old, and this part of New Zealand has been the scene of many a well-fought battle between the well-fed proprietors and their less fortunate but equally warlike neighbours.

Taranaki is situated on the western side of the North Island of New Zealand, bounded on the north by the Province of Auckland, on the south and east by Wellington Province, having a seaboard of 130 miles, and an extent of 2,137,000 acres. Fully three-fourths of this is covered by dense forest, and the remainder, unless where cultivated, consists of fern and flax land. Mount Egmont, that glorious monument of volcanic energy, looms conspicuously at a distance of twenty miles from, and about midway on the seaboard; and the nature of the surrounding country has no doubt been in some measure moulded by the action of its subterranean fires. Attaining the proud altitude of nearly 9000 feet, and a base-line of some 33 miles, it adds a charm to the landscape which it is difficult to realise from a written description, rendering also the more practical service of feeding the numerous streams that flow from its rugged sides to dispense their fertilising influences on the plains below. The surface soil around its base varies from a sandy loam, near the sea, to a rich vegetable soil in the forest. The subsoil is a light yellow volcanic ash, from six to twenty feet in depth, resting on a friable silicious sand-

stone rock overlying boulders of igneous rock, which crop out in all the water courses and on the sea-beach. Beyond a radius of twenty miles from the top of Mount Egmont the subsoil acquires a stiffer texture, especially to the north, until a good brick clay is reached at the Urenui river. In consequence of a moist climate, a temperate atmosphere, and a soil of fair quality, it may be expected that vegetation is very luxuriant. This is the case, and the intending cultivator in Taranaki will find no grassy plains fit for grazing stock, but stubborn fern and flax, and dense forest, which he must win from the wilderness before he can taste any of the delight supposed to be the privilege of landed proprietorship: but no land so well repays the cost of outlay as the land of Taranaki. If the open fern land is not exhausted by previous cropping, but well laid down in grass, it will keep from four to six sheep to the acre all the year round, but not more than one-half that amount if done inefficiently. The cost of clearing rough fern land and laying it down in grass may be estimated at £4 10s. per acre, and bush land, leaving the logs on the ground, at £4. In the early days of the settlement 40 to 60 bushels of wheat to the acre was of frequent occurrence; but now, even on new land, 30 bushels is seldom reached and rarely exceeded. The cause of this remarkable difference is not easily accounted for.

The soil and climate of Taranaki are remarkably suitable for rearing cattle, horses, and sheep, being dry yet well watered, and for the production of grass and root crops without rival. The native flax also grows luxuriantly here, the country being famed for its growth. Among the natives it had been extensively and carefully cultivated by them in the earlier days of their intercourse with Europeans. The capabilities of this province may be arrived at by assuming that her 500,000 acres of fern land were under cultivation for the grazing of sheep, which, even at the moderate estimate of two sheep to the acre, gives a capability of carrying 1,000,000, or an equivalent of other stock, representing £200,000 per annum for wool alone. In the very dryest summer there is no fear of a want of water, the streams being permanent. The forest contains abundance of valuable timber, fitted for all the requirements of the colonist. A good coalfield exists on the Mokau river; also limestone, and the finest quality of clay, fit for brick or pottery. Abundant indications of petroleum are found at the Sugar-loaves, and three companies are testing the sub-strata to find if it exists in payable quantities. The sea-beach is laden with titaniferous iron ore, which can be obtained in a state of almost purity in thousands of tons; and no soil or climate in New Zealand can produce such luxuriant flax. Possessing these great natural advantages, it is easy to predict that this portion of New Zealand will become practically what it always possessed the reputation of being—the Garden of New Zealand.

The only land at present obtainable is in the hands of private individuals, principally military settlers, who are entitled to 50 acres for their services during the war, and those who intend leaving the province are disposing of their lands at from £1 to £3 per acre. There is a large quantity of land in the hands of the friendly natives, which will be sold or let when their title is individualised in the Native Lands Court. Large tracts of the lands of those natives who have been in rebellion against Her Majesty's Government have also been confiscated by the Governor, and will soon be open for settlement.

SOIL OF TARANAKI.

SURFACE SOIL, SUBSOIL, AND PREVAILING ROCK.

SURFACE SOIL.—No analysis has been made of the soils of Taranaki, and their approximate constitutions cannot be given. It is very probable that the present surface soil around the base of Mount Egmont has been the production of a comparatively recent period. The forest that clothes its surface has not the antiquity of the American forest, whose vegetation has added so much to the fertility of the soil. Its recent origin has not enabled it to add any depth of vegetable mould to the volcanic ash that forms the subsoil. It would be an interesting inquiry to ascertain what period it took, at the present rate of growth, to form the thin covering of mould that is found in the forest, being nowhere above 12 inches deep, and thus arrive at the time when Mount Egmont poured down its fiery lava flood, or ejected the ash which buried the old forest fathoms deep and formed the present subsoil. Although the soil is light, it gives fair grain and excellent grass and root crops where the land has not been previously exhausted by the Maoris, by their system of cropping, or by their annual burnings of the fern, which no doubt is calculated to greatly impoverish the land. It is probable that there is a deficiency of phosphates in the soil, from the total absence of graminivorous animals prior to those introduced by Europeans, as the use of bone dust is found to add greatly to its fertility. After the surface is cleared from the fern or forest which covers it, no land is so easily cultivated and prepared for seed at any time of the year as the soil of this province.

SUBSOIL.—The subsoil around the base of Mount Egmont is a light yellow volcanic ash, the result of volcanic irruption or the decomposition of the primary rock *in situ*, or a combination probably of both; it is of various depths, according to its relative position from six to twenty feet. When it is first turned to the sun for the reception of seed, it is by no means prolific, but requires the action of wind, rain, and sun for a season to prepare it for a crop of less than average quantity, being deficient in decayed vegetable matter, which is so necessary an ingredient of a fruitful soil.

PREVAILING ROCK.—This specimen of rock is an average sample of the boulder formation, which forms reefs on the beach and over which the rivers flow to the sea. They are a portion of the igneous rock which once flowed from the crater of Mount Egmont, and though the grain of the crystals differ in their size, their approximate composite is about the same.

TRACHYTE ROCK.—This specimen of stone was quarried from the Moturoa Sugar-Loaf. The grain is coarse, in consequence of it being obtained on the surface; the body of the rock is expected to produce a superior building stone. This rock is also interesting in consequence of petroleum being found exuding from crevices in the trachytic conglomerate which lies unconformable to the Sugar-Loaf. The specific gravity of this rock is 2·5, and it weighs 158 lbs. to the cubic foot.

TARANAKITE.—This substance is found at the Sugar-Loaves, near New Plymouth, at the base of the cliff from which it had fallen. The peculiar substance which cements the pieces of rock together was first analysed by H. R. Richmond, Esq., of this province, and pronounced by him to be a phosphate of alumina, and named by Dr. Hector "Taranakite." It probably has resulted from the action of molten lava on a bed

of guano; the detached blocks of angular stone which in general are carried on the surface of a lava stream, being imbedded in the guano, the consequent heat, pressure, and moisture effecting in time the resultant change in its composition. If it can be obtained in sufficient abundance, which has not yet been ascertained, it may be of advantage to the agriculturists of this province.

THE FOREST OF TARANAKI.

The following is a description of the most valuable of the timber trees of Taranaki, but they bear only a small proportion to the whole of the forest, which includes a great number of smaller varieties, and the young trees of their several kinds which fill up the spaces between the larger timber trees, the whole being intertwined in every direction by the flexible supplejack, which renders travelling in the forest a very wearisome affair, except to the bushman or the Maori. During the late war the supplejack of the Taranaki forest may be said to have formed an impenetrable barrier to the bulk of the British forces, and rendered the forest almost impregnable against the ordinary operations of the troops. Scenes of rare sylvan beauty are met with round the base of Mount Egmont in parts of the forest where the undergrowth from some cause is less dense than usual. There towers the gigantic rata over the ruins of a pukatea, which has died in its mighty grasp; there the noble rimu waves its graceful foliage in the breeze, and beneath the shade of the spreading tawa the elegant fern-tree luxuriates in the subdued light. Beautiful mosses and ferns are scattered around in profusion, and save the occasional sighing of the wind or the distant murmur of the water over its boulder bed, the silence of the forest is unbroken.

Where the earth is cut deep by the course of a river, such as the Waiwakaiho or Waitara, the banks in many places form precipitous cliffs. There scenes of rare loveliness occur. The banks are clothed with bush to the water's edge, among which wave conspicuously the feathery fronds of the fern-tree; the winding river foaming over its many rapids far below, its subdued murmur just rising to the ear; and in the distance the snowy top of Mount Egmont emerging from the sombre forest, giving a noble background to the picture.

These scenes constantly occur on all the larger rivers around the base of Mount Egmont, and as cultivation advances will be so easily accessible as to render this mountain and forest scenery celebrated throughout New Zealand to all lovers of the sublime and the beautiful.

RED PINE OR RIMU (*Dacrydium cupressimum*).—This beautiful tree comes to great perfection in this province; it often attains the height of fifty feet without a branch, and a diameter at the base of from four to five feet. It comes to greatest perfection in rich, moist soils. Its foliage is strikingly graceful. The leaves are only small prickles, running up a long stem whose united weight causes the main stem to hang like the branches of the weeping willow, and the beauty is heightened by the liveliness of the colour with which it is decorated, in comparison with the sombre hue of most of the other evergreens of the Taranaki forest; it is very durable, and is extensively used for house building and cabinet work. There are

several other large timber trees not here described—viz., the kahikatea *(Dacrydium excelsum)*, or white pine, matai pine, miro pine, and the maire —each useful trees, but, with the exception of the white pine, not sufficiently abundant to be of very special value. The red pine is the most valuable tree in the Taranaki forest.

IRONWOOD, OR PURIRI *(Vitex littoralis)*.—This tree from its hardness and durability has been denominated the New Zealand oak. It splits freely and works easily; does not injure by exposure to damp, having been known to last twenty years as a fencing post (the severest trial to which wood can be subjected) without suffering much injury by decay; it is impregnated by an oily substance which probably acts as a preservator. This timber is used where great durability is required. . It is used for cart work, bridges, teeth of wheels, and fencing posts, for which it is well adapted. It grows from 20 to 40 feet without a branch, and in this province from three to six feet in diameter. It contains little sap wood, which is as perishable as ordinary wood ; the heart wood when treated with alkaline solutions produces a brilliant yellow dye.

RATA *(Metrosideros robusta)*.—There are several varieties of this tree. One grows at first as a parasite, creeping in numerous stems, like ropes, up the trunks of the other forest trees, gradually enclosing them till they perish, and then uniting to form a noble tree, taller than that which it has destroyed—with an enormous trunk, but hollow within. The branches are gnarled like those of the oak, and the trunk also from its formation is a series of strange contortions, so that the wood, being also heavy, close-grained, and durable, is invaluable to the shipbuilder for knees and timbers of all shapes and sizes. It is principally used in this province by the wheel and mill wright, being well adapted for that purpose in consequence of its great strength.

TOWAI.—This tree flourishes on the banks of rivers and on the higher slope of the ranges and Mount Egmont. It is a durable wood, well adapted for the staves of barrels, but it is chiefly prized on account of its bark, which contains a large amount of tannin; it is, therefore, valuable for tanning hides. No reliable analysis has yet been made of it, but it is said to contain more tannin per cent. than oak bark. The price at which it can be delivered at the port in its dry state is £4 10s. per ton, and the quantity is abundant.

HINAU *(Elæcarpus hinau)*.—The leaves of this tree are spiral, and of a bright green colour. The bark is very rough, and capable of producing a deep black dye; it is used by the natives to colour their flaxen mats. The timber is durable, and makes a very handsome furniture wood, but it is not sufficiently abundant to be of great commercial value.

TAWA *(Laurus tawa)*.—This tree abounds all over the district. The wood is hard and splits freely. It makes good durable flooring, but it is not durable when used out of doors, and is chiefly used as firewood. It is one of the most beautiful trees of the Taranaki forest.

PUKATEA *(Laurus pukatea)*.—This is a very common tree, growing generally in low situations, the lower portions of the stem misshapen and the roots far out of ground. The bark is smooth and light coloured, the wood soft and elastic, and not easily split; the heart wood is very durable.

PHORMIUM TENAX, OR NEW ZEALAND FLAX.

This plant consists of from a dozen to forty or fifty leaves like our flag, and two or three flower stems, all diverging from the root beneath the ground. There are ten or twelve varieties of this plant, some of which are confined to particular localities, such as low marshes, rich alluvial land, or comparatively barren hill sides; while in others a difference of character is acquired by specimens of the same variety in consequence of the difference of situation. In some situations the largest variety of the plant has leaves from ten to twelve feet in height and three to five inches in breadth at the lower end, finishing gradually to a point. The leaves are all folded in two longitudinally, the inner surface being glossy and the outer dull. When the leaf has attained its full growth it opens out, but never so much so as to lie perfectly flat: and the upper end of the leaf hangs outwards in a graceful curve. The flowers grow in bunches on the flower stems. They are large and bell-shaped, with purple petals, and are filled to the brim with delicious syrup. The seed is contained in long black pods, and is itself of a glossy black colour, and flat oval shape. The following is a classification of some of the species and varieties of the *Phormium tenax*. It is arranged according to the native system of manufacturing, but it does not follow that the first class is superior to the second for manufacturing purposes, as some of the finest fibre in this province is obtained from varieties of the second class *(Haro)*. It is at present difficult to obtain specimens of the best variety, as the cultivation of the flax has of late years been entirely neglected by the natives. No systematic cultivation of the varieties of flax has been made in this district with a view of ascertaining the plant best adapted for producing fibre to be separated by machinery, either with regard to the facility of manufacture or the fineness of fibre. If the cultivation of the flax was undertaken with the view of ascertaining these particulars it would probably do much to promote this branch of industry.

I. Flax scraped with the finger nail only *(Tihore)*:—

1. Paritaniwha—found chiefly Mangatautari (north-west of Lake Taupo).
2. Ratawa—found chiefly Hauraki, valley of Thames.
3. Kohunga—found chiefly Mangatautari.
4. Ririhape—found chiefly Mangatautari.
5. One—found chiefly Mangatautari.

II. Flax scraped with the shell *(Haro)*:—

1. Ateraukawa—found chiefly at Taranaki.
2. Manunu—found chiefly at Taranaki.
3. Huiroa—found chiefly at Taranaki.
4. Raumoa—found chiefly at Taranaki.
5. Ate—found chiefly at Hauraki.
6. Tarariki.
7. Common swamp flax, found in all parts.

III. Coarser kinds, used only for rough garments and floor mats:—

1. Aonga—variegated flax.
2. Whararipi.

I. All the varieties of flax of the first class must be planted. They require rich, moist, and flat land, but not swampy, and should be planted in rows six feet apart, with spaces of six feet between the plants. The ground must be kept clear of weeds. The best season for planting is April or May. The plants will be fit to cut in two years, and will yield a crop

every year afterwards. This flax, according to the native process of manufacture, only requires to be rent with the hand and nails without scraping, and is prepared with the greatest ease.

II. The more common species of flax requires to be scraped with a shell and then to be steeped in water for four days, afterwards taken out and beaten to clear it of the refuse, and then dried again and scraped a second time.

III. The third is of no value for European manufacture. Flax of the first class is also to be found in native plantations on the north shore of Cook's Strait, especially in the neighbourhood of Manawatu, Wanganui, and Patea rivers. It is the leaves of the plant which contain the valuable fibre resembling that of the European flax. Many processes, both mechanical and chemical, have been tried by the colonists, and by projectors in England, Belgium, and France, for adequately preparing this fibre, but hitherto complete success has not been attained in separating the fibre from some particles of a gummy nature, which render it brittle and harsh of texture when dried and packed, so that it is as yet considered inferior to the European flax.

The finer varieties, from the fibre of which the natives were in the habit of manufacturing garments of a beautiful silky texture, were extensively and carefully cultivated by them until the general adoption of blankets and other articles of European clothing put an end to the native manufacture. The carelessness with which the early trade in this article was carried on has been the cause of its depreciation in the European market; but there is no doubt that if a proper degree of attention were paid to the distinction between the different varieties—to the soil, climate, and cultivation best adapted for each—to the proper season for cutting the leaf—to the best mode of preparing the fibre—as well as the careful drying and packing of it when prepared and assorted, this plant would furnish New Zealand with one of the most valuable exports ever possessed by any country. The fibre as yet imperfectly prepared from the *Phormium tenax* is used in New Zealand and in the Australian colonies for cordage, sacking, and mattress stuffing; but the finer varieties would furnish a staple resembling silk and linen combined, from which the most beautiful fabrics might be made. Even in its roughest state this plant is most useful to the colonist or the traveller. It abounds everywhere except in the thick forest, and a leaf cut green either whole or split into the required breadth serves every purpose for which string might be necessary, from the repair of a saddle-girth or stirrup-leather, or the bandaging of a wounded limb, to the replacing of a worn-out brace, knapsack-strap, whip-lash, or boot-lace.

The separation of the oil from the seed (which it contains in abundance) by crushing and pressing would probably form a profitable adjunct to the more extensive manufacture of the fibre and paper pulp.

The land around the base of Mount Egmont in the Province of Taranaki is well adapted for the cultivation of flax for the purpose of manufacture, and it is highly probable that this plan will have to be resorted to to render it possible to separate the gummy matter from the fibre by means of machinery, in order to make it fit for the manufacture of linen cloth. The difficulties attending the cleaning of the second-class variety of flax (which is the only sort to be found growing wild), suggest the thought that if a tithe of the ingenuity, time, and money had been expended on cultivating and

experimenting on the finer varieties of the plant, the export of the fibre would by this time have formed an important item in the trade of New Zealand.

The locality where this plant is most abundant in this province is between the Stoney River, twenty miles south-west of New Plymouth and the Patea River. Opunake is the centre of this district, and is the only point on the coast south-west of New Plymouth containing a good landing place. There are thousands of acres of this plant, and it formed one of the great obstacles to the progress and operations of the troops. It was found that the flax which was cut down on the sides of the road to render communication between the outposts safer, attained the full size of the leaves in one year.

PAPER-MAKING MATERIALS.

FLAX—TOI, KIEKIE.

The coarser varieties of the New Zealand flax previously described, and the waste connected with the manufacture of the fibre, is calculated to produce pulp for the manufacture of paper. There are also other fibrous plants which from their structure would probably be adapted for the same purpose.

TOI, OR MOUNTAIN FLAX (*Dracena indivisa*).—This plant for the first two years of its growth bears a general resemblance to the *Phormium tenax*, but it ultimately forms a stem of some six feet high. It grows on the higher slopes of Mount Egmont at an altitude of some 3000 feet, where the forest proper gives place to scrub. The leaves attain a length of four feet and a breadth of four to five inches, the fibre diverging from the centre to the edge and top of the leaf; it is, therefore, shorter than the leaf, and not of the same strength throughout, but it is prepared with greater ease than the ordinary flax, and is peculiarly adapted for rope, as it does not contract in water. The natives use it in the manufacture of rough mats, used as a kind of cape to keep off the rain, it being more durable for that purpose than the flax. The fibre is coarse, and though well adapted for rope, or probably paper, it cannot rival the silky texture of the best varieties of the *Phormium tenax*.

KIEKIE (*Freycinetia banksii*).—This plant grows luxuriantly in swampy ground in the forest, and could be obtained in great abundance if its fibre were calculated to produce good paper. It bears a fruit, which the natives collect in large quantities when ripe, from which they manufacture a fermented liquor, which does duty on occasion for the more potent *waipiro* (alcoholic spirits), grateful to Maori palates.

TITANIFEROUS IRON ORE.

This ore is found in great abundance on the sea shore in the Province of Taranaki, from Mokau to the Patea, a distance of 130 miles; but the greatest accumulation lies between the Sugar-Loaves and the Waitara

river, comprising an extent of twelve miles of beach. The ore is found in various states of purity, according to the action of the winds and tide, which, under certain conditions, effect the separation of the ore on a large scale from the ordinary silicious sand with which it is mixed, when it can be obtained by thousands of tons in an almost absolute state of purity. The average quantity of ore to the mile of beach between the Waitara and the Sugar-Loaves may be roughly estimated as follows:—Taking the average width of beach at 70 yards to half tide, and the depth of the ore at one yard, and the percentage of pure ore at 50, gives 60,000 cubic yards of pure ore, equal to 110,000 tons, and which may be estimated to contain 70,000 tons of iron, the manufacture of which would involve the clearing of at least 1000 acres of forest land for converting the timber into charcoal and other uses. There are also large quantities of ore contained in the sand hills near the sea shore, varying from 30 to 50 per cent. of the bulk, and which could be easily separated by various mechanical contrivances. This ore has been analysed and found to contain—

Protoxide Iron } Peroxide ,, }	88·45
Oxide Titanium with Silica	11·43
Loss	·12
	100·00

Prior to the native rebellion in 1860 the exclusive right to work the iron ore in the land over which the native title had been extinguished in the province was granted to a Captain Morshead, who, to carry out his scheme of operation, became in some way connected with a Dr. Samuel, who eventually made large claims on the iron sand leases. The Provincial Government of Taranaki, greatly dissatisfied with the way in which these gentlemen were dealing with this important interest, got the leases cancelled. The matter has been brought before the House of Representatives of New Zealand this session, and a select committee appointed to investigate the subject reports that neither of the gentlemen have any claim whatever on the General Government, which it is to be hoped will have the effect of enabling the Government to deal with capitalists who in good faith wish to test the commercial value of this ore. Considerable experiments have been made for the purpose of discovering an effectual method of converting this ore into iron, but great difficulty seems to be occasioned by the finely-divided state in which the ore is found, causing it to choke a nordinary furnace. Various experiments have been adopted to meet this difficulty, such as mixing the sand with molten iron, and Martin's process of employing a fused silicate with which to incorporate the ore before subjecting it to the operations of the furnace. This latter process is now under investigation by Dr. Noad, of London, who acts on behalf of the New Zealand Taranaki Iron and Steel Company, with a view of ascertaining the practicability of the process and its economy in a commercial point of view. Iron said to be manufactured from this ore by Martin's process, and forged into 1¼-inch chain cables, was tested at Messrs. Parkes's chain and anchor works, Tipton, by hydraulic machinery, and was found to bear a strain of from 46 to 52 tons, ordinary iron breaking at 26 to 30 tons.

The origin of the vast accumulation of titaniferous ore on the beach at New Plymouth has often been a subject of speculation, but a little exami-

nation of the subsoil and underlying strata will soon solve the problem. A few feet above high water there crops out of the cliff a sandstone rock, which contains a large percentage of the ore; it is also found in the ordinary subsoil; in fact, on or below the surface wherever it may be looked for. By the action of the rivers in cutting through the soil, the ironsand is brought down to the coast, the lighter particles of matter brought with it being carried to sea, and the heavy ore deposited on the beach. The sea, too, has been encroaching on the land, the cliffs having been further to sea than at present, and the ironsand they contained has been separated by the action of the surf. The ore now lying on the beach has been the accumulation of ages, and the process is still going on, slowly it is true, but quite sufficient to account for the present large deposits, if time enough be allowed for the operation.

The sample exhibited has been taken from a bank of some hundreds of tons, separated from ordinary impurities by the action of the tide.

PETROLEUM.

This specimen, which is exhibited by the Alpha Well Company, and obtained from their well, has been known to exist at the Sugar-Loaves from the commencement of the settlement, where it exuded from fissures in the trachytic conglomerate on the beach, and also arises in the sea in the vicinity of the Moturoa Sugar-Loaf, where it can be observed at any time during calm weather floating on the surface. The natives attribute its origin to be the result of the decomposition of an "*atua*" (spirit) which came to an untimely end by drowning in the adjacent waters.

This oil was allowed to flow and paint the surface of the salt-water pools with its brilliant colours, and its accompanying gas to hiss as if escaping under high pressure until the past year, when an attempt was made by the proprietors of the Alpha Well to test its value by boring. They commenced sinking a shaft, which gave renewed indications of its existence by oil flowing from its walls, and the abundance of gas liberated necessitated the use of a fan to purify the workings. This gas is the light carburetted hydrogen. The shaft had to be abandoned in consequence of its abundance, and boring commenced. The well has attained a depth of 175 feet, and the indications continue still encouraging. Latterly the iron tubing which is fixed from the bore-hole at the bottom of the shaft to the surface had got out of repair, and for the purpose of fixing a new tube it was necessary to pump out the water from the shaft. It was found that, when some twenty feet of the water was removed, gas, water, and oil rose from the remaining tubing some two feet above its orifice; and when the water was allowed to rise in the shaft the ebullition gradually subsided, and again commenced when the pressure of the water was removed. This has induced the proprietors to try pumping before they commenced drilling deeper.

Besides the Alpha Company, there is the Taranaki and People's companies at work drilling. The Taranaki Company have reached the depth of 300 feet, and are now commencing another bore while awaiting steam

power and gear for the great depths. The People's Company are also down 180 feet, so that the existence or non-existence of a payable oilfield in this province will be soon decided, and the "*atua*" called up from the vasty deep or allowed quietly to subside into peaceful oblivion.

SILK.

The specimen of silk exhibited by Miss M. Gledhill weighs 370 grains, and is the produce of about 250 worms. They were fed exclusively on the leaves of the white mulberry tree (*morus alba*), and commenced spinning within fifty-one days after they came out. The other specimen is exhibited by Mrs. Yems, who has furnished no particulars. This is a material for the production of which the climate of Taranaki is well adapted, and it might furnish a valuable export if the natives could be induced to cultivate it. But this appears at present hopeless.

REPORT

ON THE

RESOURCES OF THE PROVINCE OF SOUTHLAND,

BY J. H. BAKER, CHIEF SURVEYOR.

Chief Secretary's Office, 20th September, 1866.

To the Hon. the Commissioners of the Intercolonial Exhibition, 1866.

GENTLEMEN—I have the honour of forwarding, for your information, a short report on the exhibits which have been sent from this province to be exhibited at the forthcoming Exhibition, and I have described them in the order in which they are classified by the Commissioners, giving such information respecting the individual exhibits as I have been able to collect. I have also given a few statistics on matters connected with this province which may be of some use to the Commissioners if they compile any work on the productive capabilities of the different colonies, as the result of their arduous and continuous labours.

GOLD.

The samples of gold forwarded by the manager of the Bank of Otago have been selected from gold lately purchased, and are chiefly from the Orepuki goldfield, commonly known as the Pohai diggings, situated in Tenaisnais Bay, about forty miles westward from the town of Invercargill. The principal part of the gold is obtained from claims on the beach. I have exhibited a small sample of sand from which the gold is extracted, which was forwarded to me by Mr. J. Dundas, district surveyor, with the following remarks:—

"The country surrounding the goldfield is mountainous, and covered with dense bush; at intervals of four or five miles along the coast, spurs, which are covered with bush, descend from the high lands and project into the sea, in many cases descending very abruptly. The coast line thus presents a succession of rocky prominences and sandy bays. It is in one of those bays that the gold is now being found. The ground immediately adjoining the workings (which extend along the beach for about three miles) is undulating and free from bush. The undulating plain is, however, considerably above the sea level, and descends precipitously, thus forming a range of cliffs from one to two hundred feet in height. The base of this precipice is washed by the sea at high water. It would appear that the gold comes from the cliffs, as after land-slips, which occasionally occur, the finds are always greater.

"These cliffs consist of sand quite loose at the top and gradually hardening as the bottom is approached. This continuation of sand is, however, broken by a vein of lignite which appears in almost every part of the cliff, and varies from two to seven or eight feet in thickness. Under this lignite a thin layer of quartz gravel sometimes appears; where this is the case, the find of gold is generally largest.

"At the base of the cliffs already mentioned, and under high-water mark, a black sand is found, more or less mixed with the ordinary sand of the beach; it is from this black sand that the gold is taken. This sand is frequently found on the surface, but it is at times necessary to remove as much as six or seven feet of the ordinary sand before it can be procured; the quantity of material to be removed depends almost entirely on the action of the sea, and varies with nearly every tide, as the claims are under high-water mark. The working hours are regulated by the tides, and the miners are frequently compelled to work at night.

"The number of men at present engaged in mining is about two hundred and fifty; of this number, about two-thirds have beach claims. The remainder are working in gullies in the bush, about five miles inland. The average receipts of the miners on this goldfield may be estimated at four pounds ten shillings a week for each man, some of the best claims being as high as eighteen or twenty pounds per man, while few are as low as two pounds ten shillings."

COAL.

The sample of coal exhibited by Mr. B. H. Reinecker is obtained from a seam (the thickness of which has not yet been ascertained) on a tributary of the Morley Creek. It is used as fuel in that district, but its distance from town has as yet prevented it from coming into more general use. Dr. Hector, in his report on the New Zealand coals, referring to a sample forwarded from the Morley Creek, says that "It does not display much disposition to fall to pieces. The coal is jet black, perfectly homogeneous, and it possesses considerable lustre. When first examined, its water amounted to 18·4 per cent., but prolonged exposure to the air reduced it to that indicated in the analysis. It burns freely to a red ash, without showing the least tendency to cake. Its powder and streak are black, and it yields 56·6 per cent. of brilliant coke. The exact geological formation of this coal is doubtful."

The following is the analysis alluded to:—Locality—Morley Creek, Southland; percentage of water after deducting ash, 16·01; specific gravity—

Percentage of fixed carbon ...		51·40
Volatile matter ...		30·30
Water ...		13·10
Ash ...		5·20
Colour of ash ...	Red	
Fixed carbon ...		62·91
Volatile matter ...		31·09
Percentage of coke ...		56·60
Sulphur ...		·30
Nature of coke ...	Unchanged	
Colour of powder ...	Black	
Percentage of water when first examined ...		18·40
Action of potash ...		·10

IRON.

The titaniferous ironsand from Port William, Stewart's Island, exhibited by Mr. J. H. Baker, is found in large quantities on the sea-shore in that port, and although richer in magnetic iron than the

celebrated Taranaki ironsand, it has not as yet been put to any practical purpose; it is non-auriferous. The following analyses show the comparative richness of the two kinds of ironsand:—

Character.	Locality.	Magnetic Iron.	Titanic Iron.	Hæmatite	Silicious Matter.	Iron.	Remarks.
Titaniferous Ironsand	Port William, Stewart's Islnd.	71·50	25·97	..	2·53	70·14	Contains 8·21 Titanic Acid, non-auriferous, sp. gr. 5·8882—5·882.
Magnetic and Titaniferous Ironsand	Taranaki ..	71·00	8·00	..	21·00	56·00	Non-auriferous.

STONE.

A block of syenite, cut and polished, exhibited by Mr. J. H. Baker, from the quarry at the Bluff, is excessively hard and compact, and well adapted for building sea walls, or for facing docks, &c., and other works requiring great strength; but its hardness will prevent it being used for general masonry purposes. A softer description of it is found on the other side of the Bluff Hill, which can be easily obtained and worked.

The limestones from Winton and Riverton, exhibited by the same gentleman, are of the finest description found in New Zealand. The crystallised limestone, which is found in large boulders imbedded in the limestone rock, contains 98 per cent. of carbonate of lime. The Winton limestone has principally been used for burning into quicklime, for which it is most admirably adapted. The Riverton limestone is more compact and better adapted for building purposes, for which it has been used in the Riverton district; it contains 92 per cent. of carbonate of lime, and is also used for burning into quicklime. I have sent a sample of quicklime produced from the stone of each quarry. The following analysis, made by Dr. Hector, will show the richness of the Southland limestone:—

Character.	Locality.	Specific Gravity.	Carbonate of Lime.	Carbonate of Magnesia.	Soluble Silica.	Oxide of Iron.	Alumina.	Insoluble Matter.	Colour.
Crystalline ..	Winton, Southland	..	98·80	Trace	Trace	..	1·20	1·20	White.
Crystalline ..	Winton, Southland	..	97·90	Trace	Trace	Trace	0·60	1·50	Bluish.
Shelly ..	Winton, Southland	..	90·80	Trace	not estimated	not estimated	2·20	6·80	Grey.
Granular ..	Riverton, Southland	..	92·20	Trace	not estimated	2·20	Trace	5·60	Fawn.

The samples of blue limestone exhibited by Mr. J. L. Barnhill are full of fossil shells, and will be of great interest to naturalists. No analysis of this limestone has been made, so I cannot speak of its value for burning into quicklime or other purposes; it occurs in large quantities in the district from which the samples were obtained.

WOOL.

The producers of the principal export of Southland—namely, wool, will not be exhibitors this year at the Intercolonial Exhibition. I forwarded circulars to all the wool-growers in this province, requesting them to become exhibitors, but they have all declined exhibiting wool at this time of the year, because the wool they could send would be so much shorter in the staple than that of the Australian colonies, as the shearing is so much later in this country.

It is much to be regretted that the wool-growers of this country should be debarred from exhibiting our principal export, as, from the superior quality of the breeding stock that has been lately imported into the country by the run-holders and the large grazing companies (many of which have taken the best prizes both at home and in the Australian colonies), we could have sent wool that would have reflected great credit on so young a colony.

The fleeces of Leicester and Lincoln wool exhibited by Mr. R. Hamilton and Dr. S. Hodgkinson are from sheep fed in paddocks partly of natural and partly English grasses. They have not been got up especially for exhibition, Dr. Hodgkinson's being fleeces left over from last year's shearing. Mr. R. Hamilton's fleeces are from some of the best sheep that he has at present in paddocks near the home station. The wool being considerably less than a year old, the length of the staple must necessarily be shorter than the annual clipping.

Messrs. Brown and Stewart háve exhibited a small sample of hand-washed merino wool; they also declined to become exhibitors of fleeces at the present time of year.

The following table, showing the number of sheep and value of wool exported since 1861, has been compiled from authentic sources:—

Year.	Number of Sheep.	Value of Wool Exported.
1861	73,990	——
1862	110,231	£16,846
1863	142,469	39,677
1864	235,056	53,341
1865	293,820	80,094
1866 (6 months)		

AGRICULTURAL PRODUCE.

The agricultural produce of Southland has been pretty fairly represented. Five samples of wheat, five of oats, five of barley, four of grass seed, and a few others, have been sent. The exhibitors are Messrs. Grant and Reid, Scully and Densham, and Hodgkinson, from the Riverton District; Messrs. Armstrong, Morton, Sutton, and Boyd, from the New River District; Messrs. Hay Brothers, from Invercargill District; Mr. Hamilton, from the Oleramika District; and Mr. Stewart, from the Waikioi District.

The different samples of grain, although perhaps a fair criterion of the cereals grown in the province, are not equal to what could have been shown the season before last, as last summer was the wettest that has ever been known in the country, and consequently the crops suffered a great deal during harvest, and the grain lost much of its natural bright colour.

The barley and oats, the former in particular, will, I have no doubt, be considered excellent samples of their kind, and it will probably be

these two cereals and grass seeds to which the agriculturists will in future pay especial attention, as no country could be naturally better adapted to growing these than Southland. The following seems to be the average yield per acre:—

Wheat, 39 ... Oats, 50 ... Barley, 35 bushels to the acre.

Until the last two years very little land had been brought under cultivation in this province, but now there seems to be a healthy reaction taking place, and the people are turning their attention to the real wealth of the colony. The following table will show the comparative increase of the land brought under cultivation since the year 1861:—

Year.	Area Fenced.	Area under English Grasses	Total under Crop.
1861	5,957	206	1,114
1862	9,541	241	1,871
1863	16,503	421	4,374
1864	70,341	2,148	9,549
1865 (estimated)	190,840	5,720	17,370

The following samples of New Zealand woods have been cut and polished by Mr. J. Smith, and sent as specimens of the workmanship that the principal woods of this colony are capable of. The white and red Pine are generally used for inside work; the black Pine and Totara, being more durable, are used for outside work; both of them, the latter in particular, stand any exposure to climate, and are etxensively used for fencing, piles for houses, jetties, sleepers for railways, and many other purposes. The Broadleaf, on account of its irregular growth, is well adapted for knees of ships, and other similar works. The Manuka, God, and Ironwood do not grow to any large size in this part of New Zealand, but they are all durable woods, and are often used for posts and rails, and other kinds of work the timbers of which require to be unaffected by exposure to the weather. The Totara, red Pine, Manuka, and Broadleaf are suitable for making furniture, as they can be wrought up to a beautiful polish; and when the manufacture of furniture is more remunerative, they will be extensively used for that purpose.

The samples of flour and oatmeal exhibited by Messrs. Grant and Reid, of Riverton, and Messrs. Hay Brothers, of Invercargill, are of good sound quality. Of course they cannot be expected to compete with similar articles produced in Australia, as the appliances of a new settlement are necessarily not so complete as those of longer established colonies.

MALT.

One sample of malt is exhibited by Messrs. Scully and Densham, from the Riverton District. This is the first malting establishment in this province, which from its climate is so admirably adapted for producing perhaps the best malt in the southern hemisphere; and no doubt as soon as greater facilities are offered for the disposing of it, more attention will be paid to this branch of trade.

FLAX.

Samples of flax in the different stages of manufacture are exhibited by Mr. J. Scott, of Invercargill. Great attention has been paid within the last year or two to render this natural product of New Zealand

valuable as an export to other countries, but hitherto, although extensively used in some places for local purposes, it has not yet been produced sufficiently cheap to make it a marketable commodity for export. Mr. Scott, in conjunction with Messrs. Hay and Mentiplay, intends erecting more suitable machinery for working the flax fibre more systematically, and is sanguine that, although it would not pay at the present high rate of labour to make the finer description of twines, cordage, &c., that the coarser description of articles exhibited by him will prove sufficiently remunerative to enable him to compete with importers of articles of this description. The following is a list of his exhibits:—

- Flax in the first process
- Do. hackled
- Do. suitable for roping
- Do. suitable for wool lashing
- Do. suitable for thatching
- Spun yarn, suitable for gas pipes
- Spun yarn, suitable for water pipes
- Green flax, hackled and dried, suitable for mats, &c.
- Green flax, hackled
- Prepared flax, suitable for twines
- Samples of different twines

The topographical map of Southland, showing the natural features of the country, was drawn by Mr. D. Weetman, in the Survey Department of this province. The map of the Hundreds was engraved by J. Wyld, in London, from maps prepared in the Survey Department, and sent to England for that purpose.

The following tables show the area of purchased land, the area of saleable land, and general land statistics of the province; the general statistics showing the value of imports, exports, custom's revenue, territorial and ordinary revenue of the province from 1861 to 30th June, 1866:—

Land.	Quantity.			Totals.		
	Acres.	Rds.	Poles.	Acres.	Rds.	Poles.
Area of Land purchased—						
In the Hundreds	312,488	2	4			
In the Districts	142,339	3	12	454,828	1	16
Area of Saleable Land (estimated)—						
In the Hundreds, open Land	257,792	0	0			
Do do Bush	80,000	0	0			
In the Districts, open Land	440,000	0	0			
Do do Bush	10,000	0	0	787,792	0	0
Reserves	68,918	1	12	68,918	1	12
Land fit for Depasture only	531,441	2	12	531,441	2	12
Area of Bush Land	276,333	0	0	276,333	0	0
Peat Bogs and Barren Mountains	205,400	0	0	205,400	0	0
Area of Stewart's Island	500,935	0	0	500,935	0	0
Total Area of Province	..	..		2,775,648	1	0

GENERAL STATISTICS OF SOUTHLAND,

(Compiled from the New Zealand Statistics published by the General Government.)

Year.	Total Value of Imports.	Total Value of Exports.	Customs Revenue.	Territorial Revenue.	Ordinary Revenue.	Total Revenue.	Remarks.
	£	£	£	£	£	£	
1861	71,657	8,548	5,433	20,160	591	26,184	..
1862	260,139	20,097	11,958	54,691	2,992	69,641	..
1863	866,726	91,698	64,399	50,254	16,432	135,085	..
1864	506,757	101,362	46,644	69,488	10,247	126,379	..
1865	111,656	113,606	26,052	2,271	5,201	33,524	..
1866 to 30th June	94,570	94,240	18,141	142,909	6,244	167,294	For 6 mnths. only.

Amount of Gold exported, 6 months ending 30th June, 1866 .. 1599 oz. 17 dwts. 10 grs.
Duty .. .. £200 6s. 11d.

The foregoing descriptions of the exhibits forwarded from Southland to the Intercolonial Exhibition, though far from being so complete as I could have wished, will, I trust, be of some utility to the honourable Commissioners in compiling records on the products and natural resources of the different British colonies in the southern hemisphere.

I have the honor to be, Gentlemen,

Your obedient servant,

JOHN H. BAKER, Chief Surveyor.

INTERCOLONIAL EXHIBITION, 1866-67.

DESCRIPTIVE PARTICULARS

OF THE

COLLECTION OF PRODUCTS

CONTRIBUTED BY

WESTERN AUSTRALIA.

WITH A FEW PRELIMINARY OBSERVATIONS.

REPRESENTATIVE COMMISSIONERS AT MELBOURNE:

J. B. WERE, Esq. | R. H. BLAND, Esq.

SECRETARY—E. G. ATKINSON, Esq.

INTERCOLONIAL EXHIBITION, 1866-67.

The following is a list of the Members of the several District Committees acting on behalf of Western Australia :—

Albany.

SIR A. T. COCKBURN CAMPBELL, BART. *(Chairman)*	REV. W. S. MEADE
	MR. H. CAMFIELD

MR. JOHN M'KAIL.

Tooday, Northam, Victoria Plains.

MR. W. J. CLIFTON *(Chairman)*	MR. J. M. DEMPSTER
„ J. DRUMMOND	„ A. W. MORGAN

MR. DONALD M'PHERSON.

York and Beverley.

MR. W. COWAN *(Chairman)*	DR. M'COY
„ S. E. BURGES	MR. AUGUSTUS LEE STEERE
„ S. S. PARKER	REV. E. MILLET

Bunbury, Australind, Blackwood, &c.

MR. GEORGE ELIOT *(Chairman)*	MR. JAMES LEE STEERE
„ W. P. CLIFTON	„ J. G. THOMSON
„ THOS. LITTLE	„ PEMBERTON WALCOTT

MR. W. FORREST.

Vasse.

MR. J. S. HARRIS *(Chairman)*	MR. W. R. BUNBURY
LIEUT.-COLONEL MOLLOY	REV. H. W. BROWN
MR. J. B. BUSSEL	MR. H. YELVERTON

Champion Bay.

MR. A. DURLACHER *(Chairman)*	MR. THOS. BURGES
„ L. C. BURGES	„ KENNETH BROWN

MR. C. CROWTHER.

E. W. LANDOR, SECRETARY.

DESCRIPTIVE PARTICULARS

OF THE

PRODUCTS OF WESTERN AUSTRALIA.

The colony of Western Australia, as defined by Her Majesty's Commissioners, includes all that portion of New Holland situated to the westward of 129° E. longitude; its greatest length is, therefore, 1280 miles from north to south, and 800 miles from east to west. The city of Perth is situated in latitude 32° south,

With a coast of 2000 miles on the Indian Ocean, and with a westerly aspect, from which the prevailing winds blow, there are abundant rains during the tillage season, and the farmer is relieved from that anxiety about his crops which is felt in other parts of Australia on account of drought. There is also abundance of edible fish on the coast and in the numerous estuaries. The heat of summer is moderated by alternate land and sea breezes. All sorts of vegetable and fruit-trees flourish luxuriantly, especially the vine, and the land bears good crops of grain of all kinds, particularly on the low alluvial flats which line most of the rivers. The Darling and Roe ranges of hills, rising to the height of 1500 to 2000 feet above the sea level, lie parallel to the western coast, at ten to twenty-five miles from it, and are dotted with numerous thriving farms amongst its hills and valleys. These ranges are twenty to fifty miles across, and on their eastern side the undulating grassy lands are situated which constitute the principal sheep and cattle runs.

The Colonial Secretary, in a report made at the end of 1858, says :—"The colony possesses one of the most healthy climates in the world. The mortality since its occupation has not averaged one per cent. I doubt if any portion of the world is better suited to the European constitution. The mean of the barometer is about 30 inches, and of the thermometer about 63°. I believe that in general salubrity of climate, Western Australia possesses a marked superiority over any of the Australian colonies. It is subject to no extremes of heat or cold. Cattle have never been known to die from lack of water, and in the very driest weather there is a sufficient supply of food for them. Exposure to weather, by night or day, appears to produce no ill effects on the constitution of the colonists, many of whom, for months together, rarely sleep in any but the most

temporary dwellings. Snow is never seen; ice only in the depth of winter, and then only in the very early morning. As in New Zealand, both maize and potatoes ripen in this country, and the latter crop is grown to a considerable extent. The apple and the pear, the orange, banana, fig, peach, and apricot, with the melon and the vine, grow luxuriantly, and may be seen ripening at the same time. The colony is peculiarly adapted to the growth of the vine, on the cultivation of which much attention is bestowed, and which is likely to prove very remunerative. English and tropical vegetables are largely cultivated, and yield profusely. Attention is also being directed to dried fruits; and specimens of figs and raisins that have been sent to the periodical horticultural exhibition for competition are little inferior to those imported from Europe."

Lord Grey, in the House of Lords, on the 13th of March, 1861, thus alludes to Western Australia:—"The development of the resources of Western Australia is a matter of the highest moment. Coal is to be found there, and, in steam communication with India, I need scarcely remind you of the vast value of such a product. Further, I may state that Western Australia abounds with forests of the finest timber, while it possesses a climate and soil capable of producing anything which a tropical region of the earth may be expected to yield."

Owing to the superior attractions of the goldfields discovered in neighbouring colonies, the tide of emigration from England has hitherto swept past the shores of Western Australia, and but little is known abroad of its actual capabilities and resources.

The want of labour compelled this colony to apply for convicts at the time when transportation to Tasmania was about to cease. The convict system has, without doubt, been in many respects a great boon to the colony, and has tended to enrich many flockowners, stockowners, merchants, and tradesmen. On the other hand, it has introduced a description of peasantry much inferior to that class of men who, in the old world, and in less progressive times, were justly termed "their country's pride."

In this state of the community, stringent laws for the repression of crime are a necessary consequence, and the result shows that up to the present time, notwithstanding the introduction of convicts, there has been, in proportion to the population, probably a less amount of serious crime in this colony than in any other part of Her Majesty's dominions. It is true that a very large number of the convict community are annually fined or imprisoned by the magistrates for drunkenness, for being out after ten o'clock at night, and for other petty offences against the regulations applicable to this class. All serious offences are dealt with in the Supreme Court, where, however, the cases are extremely few, and generally for cattle-stealing and petty thefts and forgeries.

In fact, greater safety is felt by travellers in this colony by day or night than in most other parts of the world.

The colony also possesses, besides the necessarily large Government expenditure, the advantage of a good supply of labour from the ticket-of-leave class, who, from the stringent discipline to which they are subject, are the most easily managed of all that grade of men. Many of them, it must be admitted, are idle and of little value, but they can always be returned to head-quarters, and their places filled by others.

Although the territorial extent of the colony is great, the population is still extremely limited. There is room for many thousands of enterprising

settlers. During the last twelve months several gentlemen of capital from South Australia, finding the grazing country so much superior to what they had imagined, have become denizens of Western Australia, and have taken up sheep runs in the southern districts, thus utilising lands which our own settlers have hitherto allowed to remain unproductive. Others have taken their flocks northward, to the Nichol Bay country, where several flockowners from Victoria also are located. To this district (Nichol and Roebuck Bays) there will doubtless soon be a rush.

Between Roebuck Bay and Nichol Bay, Mr. Cowle, Government Surveyor, recently reports having passed over millions of acres of first-class pastoral land. The grasses have a peculiarly succulent character, and are found to remain nutritious even after a drought of eighteen months. The Government Resident, Mr. Robert J. Sholl, writes under date of April 23, 1866 :—"We are all getting on well here (Nichol Bay). The country green and pleasant, plenty of water and grass ; all the stock fat, and the people contented and cheerful ; no scurvy or disease of any sort, and all full of hope."

There is a great extent of unoccupied country on the eastern side of the colony, recently opened by Mr. H. M. Lefroy and Mr. Hunt. Water is abundant at a few feet below the surface, and the feed in summer was at least of average quality.

The "Land Regulations" for Western Australia afford great inducements to flockowners and squatters. Their principal features are the following :—

Sale of country lands to first applicant, without auction, at 10s. per acre, in blocks of 40 acres and upwards.

Sale of town lands in small allotments by auction at an upset price varying from £1 to £6.

Pastoral lands are divided into three classes, A, B, and C.

Land in class A is that nearest the settled districts, and is let on annual tenure, at the rate of £1 per 1000 acres. All lands so let are open to purchase to first applicant.

Land in class B comprises all land in the settled districts not in class A, and is let on lease in blocks not exceeding 10,000 acres for terms of eight years, with preferable claim of lessee to renewal. The rent for each lease is £5 per annum, and 10s. for every 1000 acres comprised in it. The lessee has the pre-emptive right over the whole lease during the first year, and over such portion as he may choose for his homestead during the two succeeding years, after which all the land is open to general purchase.

Land in class C lies in the newly-discovered districts to the north and east. Permission for free pasturage for one year for stock is granted to applicants, during which they are entitled to select 100,000 acres of land in one block, of which a free run is granted during three years, after which period leases are issued in blocks not exceeding 20,000 acres for eight years, on the annual payment of £5 for each lease, and 5s. per 1000 acres during the first four years of its currency, and 10s. per 1000 acres during the last four years. Lessees are entitled to a preferential claim for a renewal of such leases.

Tillage leases are granted in blocks not exceeding 320 acres for eight years, on an annual payment of £5 for the lease, and 1s. for each acre

comprised in it, the lessee having a pre-emptive right over any portion of the land during the currency of his lease.

Licenses to cut timber are issued on easy terms, either to a pair of sawyers per month, or per square mile to those largely engaged in the timber trade.

Mineral Lands.—Every facility is afforded to test mineral lands by annual license, on payment of 2s. per acre for the first, and 4s. for the second year; such land being satisfactorily tested, leases of ten years' duration are issued at 8s. per acre per annum, with pre-emptive right during the currency of the lease.

Mineral lands are sold at a fixed price of £3 per acre—£1 per acre payable on application for the land, and £1 per acre in the two succeeding years.

TIMBER AND WOODS.

The principal timber trees of this colony are of the Eucalyptus or Myrtle family. Amongst the most generally useful of these is that commonly called mahogany, and by the natives jarrah.

Of this wood it was stated some years ago by Admiral Sir James Stirling, before a Committee of the House of Commons, that there is sufficient to build twenty British navies.

None of the neighbouring colonies possess timber of similar character to the jarrah, or endowed with equally valuable properties.

If cut at the proper season, *when the sap is down* (a precaution too little attended to), it will be found to be the most enduring of all woods. On this condition it defies decay; time, weather, water, the white ant, and the sea-worm have no effect upon it.

Specimens will be found in the Exhibition of portions of wood which have been nearly thirty years partly under water and partly out.

Others have been used as posts and for the same period buried in the sand, where the white ant destroys in a few weeks every other kind of wood.

For this peculiar property the jarrah is now much sought after for railway sleepers and telegraph posts in India and the colonies. It is admirably adapted for dock gates, piles, and other purposes, and for keel-pieces, kelsons, and other heavy timber in shipbuilding.

The chief objection raised against it is that it is liable to "shakes," the trees being very commonly unsound at heart.

In this colony vessels of considerable burthen are built entirely of this wood, the peculiar properties of which render copper sheathing unnecessary, although the sea-worm is most abundant in these waters.

Another most valuable kind of timber is a variety of white gum, called the *Tooart*—close-grained, not to be split, very hard, and capable of enduring a great amount of heat without rending. It is used for keels, capstans, windlasses, naves of wheels, &c., also in the engine-rooms of steam-vessels, liable to exposure to great heat.

Both tooart and jarrah were used to a small extent in the construction of H.M.S. Hannibal, and the former wood especially met with high encomiums from the Admiralty surveyors.

The *Bluegum*, which grows in immense forests, and attains a vast height and size, to the southward of Cape Leewin, is allied to the tooart, and quite distinct from the Tasmanian one.

A splendid field for capital will be found in these magnificent timber forests, and every inducement is offered by the local Government for its introduction. The license fees are merely nominal, labour is cheap and abundant (although of a rough kind), and the chief difficulty at present experienced is the high price of freight.

The *Sandalwood* of Western Australia has long proved a most valuable export, in large quantities, to Singapore and China.

The *Raspberry-jam*, a species of acacia, has an agreeable scent, and is well adapted for cabinet purposes.

The *Casuarina*, or Sheoak, is remarkable for its numerous large bars of radial fibre, which render it difficult to be split in the direction of its circumference, and it shrinks the least of any wood in the direction of its radius. The *Sheoak* is used not only for shingles, but for axe-handles, spokes and felloes, &c.; the *Morell* for shafts, &c.

Both the white and blue gums are so hard as to be used for tramways.

OBSERVATIONS ON THE JARRAH, OR MAHOGANY, BY JAMES MANNING, ESQ., C.E.

"Jarrah, or Djaryl," is the "Eucalyptus marginata," commonly called mahogany from its similarity to the wood from Honduras and the West Indies. It is applicable for every purpose for which ornamental wood can be required, some of it being of the very finest grain and showing much figure, mottled curls, feathers, and excrescences, a feature peculiar to colonial wood, and highly effective in point of ornament, as will be seen from the specimens forwarded.

While it is highly adapted for ornamental purposes, it is no less valuable as a timber for heavy work, where strength, durability, and the property of resisting the attacks of the "white ant" and "Teredo navalis" are necessary.

Thus for timbers of all kinds for houses, warehouses, wharves, jetties, bridges, &c., it is invaluable.

For piles it should be used whole (not cut into quarters), either round, or hewn; the former is preferable, there being very little sap, and the outside portion of the heartwood is stronger by far than the inner portions, near the centre; hence the desirability of keeping the annular rings complete.

The timber of this colony is, moreover, subject to the peculiarity of being defective at heart, and although the sound timber does resist the teredo and white ant, the heart and defective portions do not. Hence the importance of keeping the outer annular rings intact, for neither of the insects will touch the sound wood.

MINERALS.

There is an inexhaustible quantity of *iron ore* in this province. A bar reduced from magnetic iron ore taken from the Darling range of ironstone hills was some time ago proved in conjunction with one of iron of commerce and one of Swedish, both the latter being reduced from flat iron to assimilate them. The result was a deflexion of about five to eight in favour of the Western Australian iron.—[*Report of Captain C. M. Gram, R.E.*]

Gold has not yet been discovered in the province, but *copper* is found in profusion, and the ore exceedingly rich in quality.

The following observations are from the pen of *Mr. Frank Gregory, F.G.S.*:—

"THE VICTORIA DISTRICT OF WESTERN AUSTRALIA, ETC.

"The Victoria District of Western Australia, which has of late years risen to so high and important a position among the mineral-producing provinces of this continent, was first discovered and named by Captain, now Sir George Grey, in the year 1839 ; and a better or more graphic description of its scenery and general aspect cannot be given than that contained in his interesting volumes on Australia.

"Standing in the heart of the mineral country between Moresby's range and the sea, Sir George says :—'I turned to the north-eastward, and there burst upon my sight a most enchanting view. In the far east—that is, some twenty or twenty-five miles away—stretched a chain of mountains, flat topped, and so regular in their outline that they appeared rather the work of art than of nature. Between this range and the nearest one lay a large rich valley, vieing with the most fertile I have ever seen in an extra-tropical country. In front of us lay another valley, which drained a portion of the large one, and in both rose gentle swelling hills, and picturesque peaks, wooded in the most romantic manner. The distant range I at once named the "Victoria," in honour of Her Majesty, and being now certain that the district we were in was one of the most fertile in Australia, I named it the "Province of Victoria." There is no part of extra-tropical Australia that can boast of the same number of streams in an equal extent of coast frontage, or which has such elevated land so near the sea ; and I have seen no other which has so large an extent of good country.'

"With the exception that Sir George has rather over-estimated the extent of good country, his description may be taken as tolerably correct.

"Turning from the superficially descriptive appearance of this valuable tract of country to the distribution of its mineral riches, its present known limits may be defined as lying between the Geraldine mine on the Murchison river, in latitude 27° 50′ S., and latitude 29° 40′ S. on the upper Irwin river, and extending from near the seacoast eastward to a depth in some places of forty miles, embracing an area of between 4000 and 5000 square miles, one-fourth of which is known to contain extensive bodies of copper and lead, and seams of coal, with silver, antimony, plumbago, arsenic, and iron in smaller quantities ; minute specks of gold have also been found by washing the sands in the beds of some of the streams.

"Beginning to the south, on the upper Irwin, we find the first well-defined lode to be a very promising one, rich in red oxides and blue carbonates of copper, making its appearance on the surface in close contact with extensive elvan dykes, protruding through compact gneiss rocks, which here have an elevation of from four hundred to five hundred feet above the sea, and lie near the western foot of a tract of horizontal sandstones, belonging to the cretaceous period, which to the eastward overlays it to the depth of three hundred feet and upwards.

"Twenty-five or thirty miles to the northward of this lode, and in the bed of the northern branch of the Irwin river, is an extensive development of the coal formation, in which were discovered, in 1846, two seams of coal, of a very fair promise as to quantity, and which, if worked to a

sufficient depth, will probably yield a quality suitable for smelting purposes, only surface specimens having as yet been procured from seams, one of which was three and another six feet in thickness.

"Between this point and Champion Bay the mineral country is almost entirely buried under the cretaceous sandstones. Near the latter place the gneiss and mineral-bearing rocks again make their appearance, having been denuded by the numerous streams flowing from the interior, which have cut through the sandstone to the depth of from one hundred and sixty to two hundred feet, leaving many detached portions of the table-lands with their original elevation, Moresby's range forming the principal group of this character.

"Immediately to the north of Champion Bay, commencing with the 'White Peak' mine, is a series of lodes of both copper and lead; nearly the whole of the country that has been denuded of its sandstones giving indications of rich mineral deposits, crowded together in such close proximity that it is difficult to find a square mile upon which indications are not to be found that would be considered sufficiently promising in Cornwall to at once establish workings.

"These lodes gradually increased in number and the richness of the ores produced, until, at thirty-three miles northward, we arrive at the 'Wanerenooka' mine, which may be considered to be about the centre of mineral development.

"It would be quite beyond the limits of this sketch to attempt to describe the exact nature and extent of the numerous lodes that have been more or less examined, or mining operations commenced upon; the principal ones, as far as they are yet known, are in the vicinity of this mine. A little to the south is the 'Gevella,' the principal yield of which has hitherto been the yellow sulphurates, containing from twenty-four to thirty-two per cent. of copper. To the westward, at three miles, is the 'Wheal Tortura,' a highly-productive and promising mine, rich in green and grey copper ores, with a gentiferous lead, and veins of yellow sulphurates.

"A few miles to the northward of this mine, and near Martin's Spring, is another lode of considerable extent, yielding both sulphurates of lead and copper, the lead apparently predominating.

"Again, at about three miles to the north of the 'Wanerenooka' is the 'Yanganooka,' differing somewhat from the others, the copper being generally distributed in the form of a green carbonate through a considerable mass of soft white feldspatic rock, much displaced by the eruption of a quartz dyke.

"To the southward and eastward, for a distance of ten or fifteen miles, are a vast number of lodes, both of lead and copper, the principal distinguishing features of which are their being accompanied by a much larger development of gossan than the mines already named. As yet few of them have been sufficiently opened to enable me to give any decided opinion upon them; but there is great reason to believe that amongst them there will be found many valuable and productive mines.

"From this part of the district northward to the 'Geraldine' mine the greater part of the country is again buried under sandstones, and it is only in consequence of the abrading influence of the Murchison river and its tributaries that we are again enabled to trace up a number of lodes of both lead and copper, the principal of which is the well-known 'Geraldine'

lead mine, which has been worked at intervals with various and doubtful success during the last twelve years, having originally been opened injudiciously in the bed of the river, and the workings in consequence frequently interrupted or destroyed by the periodical inundations.

"The main characteristics of the lodes throughout the entire district are their maintaining an almost undeviating direction of north 32° east, with a strike generally to the north-west, varying from 5° to 15° from vertical, and are frequently traceable, with a few breaks, for a distance of three or four miles. Accompanying these lodes are numerous elvan dykes, taking the same direction, but of greater length and breadth, and varying much in appearance, sometimes assuming the character of pure white quartz, and in others that of porphyry and serpentine.

"Killas is by no means so plentiful here as in Cornwall, while the frequency of places in which gossan can be traced, containing particles of lead or copper, far exceeds anything of the kind to be seen in the richest mineral districts of the west of England.

"In connection with the foregoing facts, it is of some importance to state that the harbours of Champion Bay and Port Gregory afford to the district ample natural facilities for the accommodation of the shipping requisite for the transportation of its mineral products, the former harbour having now been frequented by vessels of considerable tonnage ever since its settlement in 1850, without a single casualty having occurred; while at the latter port the addition of a beacon and a few mooring-chains would enable vessels not exceeding a draught of twelve or fourteen feet at all times to load in perfect security.

"Another, and no less important condition this district possesses is the large amount of arable lands to be found on the banks of the Greenough and Chapman rivers, in the immediate vicinity of the mines, capable of yielding ample supplies of grain and forage for the support of a population and stock adequate to carrying out, to its fullest extent, the development of its apparently unlimited mineral resources."

For want of capital but little has been done in mining operations.

The *Wanerenooka* mine is now in the hands of a few proprietors. The ore is abundant, but the water has proved troublesome. Specimens of ore sent for exhibition. The mine is thirty-two miles distant from the port of Champion Bay.

The *Fortune* copper mine is rich in quality, and has produced ore yielding thirty-four and thirty-five per cent. It is now in the hands of a company with limited liability. Specimens of the ore are exhibited.

The *Yanganooka* copper mine, comprising 160 acres of land, is the property of Mr. George Shenton. Plans and specimens of lodes are exhibited. Distant from port thirty-five miles.

The *Wheal-Arrino* copper mine is rich in mineral. The lode is visible for several miles along the surface, eight feet in width. A surface specimen is sent.

The *Irwin* copper mines are the property of Mr. G. Shenton. Specimens exhibited.

The *Gwalla-Gwalla* and other mines, exceedingly rich in copper, the property of Mr. G. Shenton and others, are for sale, and afford an advantageous opening for companies.

Private individuals engaged in various other pursuits cannot conveniently carry on works requiring a large amount of capital. Such works

must be undertaken by companies especially devoted to the object. By-and-by, no doubt, capitalists will be found to direct their attention towards the Champion Bay district, and mining operations will be carried on with vigour and success.

The *Narra-Tarra* copper and lead mines are the property of a company.

The *Gallireah* is the property of Mr. J. Drummond. Specimens and plans are exhibited.

The *Geraldine* lead mines are also extremely valuable. Large quantities of ore have been taken, varying in richness from seventy to eighty-six per cent. of pure lead. Just at this time operations have ceased for the present in consequence of the rush of water in the River Murchison having flooded the mine, an accident to which this mine is necessarily subject, the entrance shaft being situated in the bed of the river.

COAL

Is found but not yet worked on the Irwin river, in the Victoria district, and also on the southern coast, near the Fitzgerald river. It is of the character of Welsh coal, well adapted for engine purposes.

WINES.

The vine flourishes here in the utmost luxuriance. In every variety of soil—in sand, in marl, in limestone—it appears equally at home. There are, however, as yet few large vineyards, two or three only being from ten to thirty acres in extent, but many of them are annually increasing in size. The wine produced is all consumed in the colony, and usually the same year in which it is made. There are not many casks of wine four years old. It is therefore scarcely fair to pronounce it of any character at present, but beyond doubt the *promise* of excellence in quality is very great. The fruitage every year is most abundant. No ill-treatment from inexperienced hands prevents the vine in this climate from yielding a large crop of grapes.

The wine produced, although so new, is greatly preferred to the adulterated mixtures commonly imported.

But few samples are forwarded for exhibition, as the wine-growers do not seem at present to care for an extended market. Perhaps, also, they fear that a premature display would only result in prejudicing foreign dealers against them, and therefore prefer waiting until their wines have acquired the advantage of a few years in age.

The principal wine-growers are *A. Waylen*, Esq., M.D., Guildford; *John Ferguson*, Esq., Middle Swan; *W. P. Clifton*, Esq., Australind; *William Harris*, Esq., Swan; *Thomas Little*, Esq., Leschenault; *John Wall Hardey* and *Joseph Hardey*, Esqs., on the banks of the Swan, near Perth; and *H. Maxwell Lefroy*, Esq., Fremantle.

We add an extract from a letter lately received from a gentleman occupying an important post in Queensland:—"With regard to your wine, I can now safely venture to give an opinion, as I have had thirty gallons sent to me here, and it has stood both the journey and the heat very well, and is quite sound and free from acidity. Many persons have now tasted it, and I am able unhesitatingly to say that any quantity you could send of the same quality as 'Garden Hill' would find a ready sale at 12s. per

gallon, and probably, when once fairly established in the market, 20s.; but to do this with advantage it should not be sent before it is two years old, and it should be consigned to one of our regular wine merchants, or it would run a risk of being jostled out of the market, even if equal to old Tokay. It would not be desirable at first to send the lighter wines, unless of very superior class, as the tariff here is now 3s. per gallon on all wines under twenty-five per cent. (Sykes); and also, as the expense would not be less (including freights) than from 1s. 2d. to 1s. 6d. per gallon except on large consignments, it would hardly pay. But when the trade was once fairly established, you could send almost anything, as we now pay 15s. per gallon for New South Wales wines, that would only be sold by the bucket at the Swan. I regret much that my present occupation precludes my taking an active part in bringing the matter to a practical issue, but I am sure it would be well worth the while of any of your merchants, that have an agent here, sending round a small shipment of say sixty or one hundred pipes of well-selected wine, not less than two years old, as it would soon result in a thriving trade. New South Wales never has, and never will be able to produce any quality or quantity of wine that could compete with Western Australia."

HORSES AND CATTLE.

Horses form an item of export to Singapore, Madras, and Calcutta. The voyage to these ports is easy, and usually rapid. The colony is admirably adapted for horse-breeding, but, although many shipments have been made with fair profit, the settlers have not followed the pursuit systematically. Many very fine and valuable stallions have been imported, but too little care has been taken to preserve purity of breed. The stock has been seldom kept in paddocks, but allowed to run wild in the bush, and, therefore, soon deteriorates.

Most of the country is adapted for cattle, but the neighbourhood of the Irwin river, in the Victoria district, has been for some years prominent in this respect.

OTHER PRODUCTS.

Oranges, peaches, nectarines, almonds, olives, apples, pears, and many other fruits grow in this climate to the greatest perfection.

The native *gums* are of great variety, and many of them are already acquiring a good name in the London markets. Specimens of red gum, manna, wattle, and black-boy (*Xanthorrhœa*, or grass tree) will be found exhibited.

Specimens of the black-boy are forwarded for the purpose of ascertaining whether it possesses any peculiar properties over those of Victoria.

Petroleum is, we have no doubt, to be found in many parts of the colony, but attention has only just been turned towards this valuable natural product.

Of *Wools* we need say nothing. If the prices obtained in the London market are at all lower than those obtained by growers in New South Wales, the fault is owing to our flockowners themselves.

There is an immense abundance of *fish* on the coast and in the estuaries. The snapper (only inferior to cod) is an article of export. The herring and gray mullet are caught in large quantities. The whiting is plentiful, and of superior quality.

CONCLUSION.

We have only to add that there is at length every prospect of the tide of good fortune setting towards our shores. Capitalists from other colonies are beginning to think there is a good and long-overlooked field for enterprise in Western Australia.

One of the greatest wants of the colony is that of improved communication between the outports. The passenger and goods traffic between Fremantle and Champion Bay and Nichol Bay to the northward, and Bunbury, the Vase, and King George's Sound to the southward, requires the aid of steam. The speculation would prove a good one, and no doubt this vein of wealth will soon be opened out.

My samples exposed to the light
& changes of temperature & turned back
up.